THE RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
The Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · The Railway Record.
Railways Illustrated · Established 1835 · The Railway Official Gazette

Published Every Friday
at
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "Trazette Parl., London"
Telephone No.: Whitehall 9233 (6 lines)

Annual subscription payable in advance and postage free
British Isles and Abroad.....£2 5s. 0d.
Single Copies.....One Shilling
Registered at the General Post Office, London, as a Newspaper

Vol. 64. No. 10 Friday, March 6, 1936

CONTENTS

	PAGE
Editorials	429
Letters to the Editor	434
Publications Received	435
The Scrap Heap	436
Overseas Railway Affairs	437
Further Impressions of Overseas Transport	440
The New Cornish Riviera Trains of the G.W.R.	441
Two New Herbert Dieheads	446
Long Welded Rails	447
The Design and Manufacture of Containers	453
Railway News Section	455
Personal	455
Railway Meetings	458
News Articles	476
Notes and News	483
Contracts and Tenders	486
Parliamentary and Official Notices	487
Railway Share Market	488

ELECTRIC RAILWAY TRACTION

A Supplement illustrating and describing developments in Electric Railway Traction is presented with each copy of this week's issue.

A Professional Chairman?

THE success with which Sir Arnold Wilson, M.P., although not an engineer, presided over the joint gathering of eight technical societies on March 3, when a symposium on railcars (to be dealt with in the next issue of the *Diesel Railway Traction Supplement*) was read and discussed, makes one wonder if the practice of having an independent non-technical chairman, well versed in public speaking, might not be extended to the ordinary meetings of learned societies. Too often the discussion at these gatherings tends to become stagnant or wavering through lack of genial and kindly encouragement from the platform. To those who were present at the Royal Geographical Society's hall on Tuesday night, the wit and skill of the chairman in handling a meeting comprising, in addition to the four authors of the papers, an audience of well over 300 having eight separate although interdependent interests, will long be a pleasant memory. But it will inevitably bring a hope that Sir Arnold, or another of his ability, will preside at future meetings, keeping the discussion brisk by a rigid adherence to the ten-minutes-standing rule, making it useful by insisting upon adherence to definite points as distinct from a general ramble, affording every assistance to contributors to the discussion by inviting them to speak clearly from the platform, and finally by a becoming self-effacement from the beginning of the discussion.

* * * *

The L.M.S.R. Meeting

Sir Josiah Stamp's address to the stockholders of the London Midland & Scottish Railway at the annual meeting last Friday was inspiring and hopeful. The traffic receipts for the whole year 1935 were better than had been anticipated and what may be called the permanent economies progressively introduced have continued to be effective. Net revenue results for the past year were the best since 1930 when, in order to pay the 2 per cent. dividend on the ordinary stock (£1,904,049) the sum of £1,158,600 was appropriated from reserves and nothing was carried forward. The Chairman was easily able to justify crediting the revenue for 1935 with an anticipated saving of at least £885,000 in respect of local rates, and gave a clear explanation of the railway rating position. All classes of traffic contributed to the increased earnings, except parcels, in which the decline was attributable solely to the action of the Post Office. The fall in first class receipts was arrested by the reduction in the monthly tickets from 1⅔d. to 1½d. a mile, for with an increase in the distances travelled a small increase in receipts was achieved. Steamship results were the best in the history of the company, and the docks made a small direct contribution to net revenue. Accelerations had not affected punctuality and there was a general improvement in operating efficiency. Attention was called to the new campaign of propaganda by the road interests. Reconstruction of Euston station would, it was explained, lead to a great increase in operating efficiency, to the ultimate benefit of net revenue.

* * * *

The Week's Traffics

A satisfactory batch of traffics is announced by the four main line railways for the past week, which have materially advanced the percentage increases for the year to date. The total increase for the week is £136,000, comparing with an increase of £93,000 for the previous week. For the year to date the estimated traffic receipts of the four companies together are £24,304,000, an increase of £683,000, or 2·89 per cent. Passenger train receipts of the four companies for the year to date are up £58,000, merchandise earnings show an advance of £192,500 net, and coal class an improvement of £432,500.

	9th Week				Year to date	
	Pass., &c.	Goods, &c.	Coal, &c.	Total	Inc. or Dec.	
	£	£	£	£	£	%
L.M.S.R.	+ 5,000	+ 30,000	+ 17,000	+ 52,000	+ 292,000	+ 3·04
L.N.E.R.	− 2,000	+ 15,000	+ 33,000	+ 46,000	+ 234,000	+ 3·27
G.W.R.	− 3,000	+ 15,000	+ 9,000	+ 21,000	+ 98,000	+ 2·49
S.R.	+ 6,000	+ 3,000	+ 8,000	+ 17,000	+ 59,000	+ 2·01

The Great Northern Railway (Ireland) records to date increases of £2,450 and £3,650 respectively in passengers and goods. On the Great Southern passenger train receipts are up £8,634, but goods train receipts are down £3,005.

* * * *

Northern Counties Committee (L.M.S.)

A general improvement was shown in 1935 when the railway gross receipts of £364,201 advanced by £22,130, and in the railway expenditure of £399,211 there was a saving of £1,473, thus reducing the loss on working by £23,603. Amongst ancillary businesses the profit on the hotels department was reduced from £3,912 to £1,392,

but the net receipts from road transport improved from £9,843 to £11,151, although the working was for nine months only in 1935 against 12 months in 1934. On October 1 last the committee's fleet of 52 road motors for goods and of 131 omnibuses was transferred to the Northern Ireland Road Transport Board, and the capital account shows a credit of £160,251 in respect of these vehicles, and of £49,040 for garages, &c. transferred. General financial results are compared below.

	1935	1934	1933
	£	£	£
Capital expenditure ..	3,730,730	3,943,511	3,915,395
Gross receipts from businesses	524,863	530,072	489,248
Revenue expenditure on ditto	547,330	574,930 ..	577,658
Net receipts of ditto .. *Dr.*	22,467 *Dr.*	44,858 *Dr.*	88,410
Miscellaneous receipts net	7,228	7,774	7,341
Total net income .. *Dr.*	15,239 *Dr.*	37,084 *Dr.*	81,069
Interest, rentals, &c. ..	1,267	1,341	1,382

Total receipts from passengers were £146,355, an increase of £8,143 which was entirely due to third class. Mails and parcels brought in £8,939 more, at £63,796. In the goods train traffic receipts of £149,544 there was an increase of £4,404.

* * * *

Travel in Estonia and Finland

A correspondent recently returned from a tour of Baltic countries has sent us some interesting notes on travel there, where he was particularly impressed by the use made of the extra carriage width on the 5-ft. gauge lines inherited from Russian days. He says that in Estonia, with snow all round, double windows to the carriages, and a huge oil-stone burning stove to every carriage, the putting up of the beds at night is quite a sight. Climatic conditions are naturally important in their effect on local custom, and especially on the Estonian railway waiting room. It is a poor country with not many trains, and travellers often have to wait hours at some junction. The waiting room is open all night, and an attendant keeps up the huge stove and has a boiler with hot water always ready and free for anyone who wants it. The Estonian mother can heat up her baby's milk at a minute's notice and without a penny of charge or tip. The absence of any tipping system was our correspondent's main impression of the Finnish railways. There are notices all over the railway premises in half a dozen languages that the railway staff is properly paid and that it accepts no tips. " Further," our correspondent concludes, " it *does* accept no tips. I offered one once to a Finnish restaurant car waiter (it was really a waitress) and got my money indignantly pushed back at me."

* * * *

The Business of a Wagon Finance Company

There are probably many not directly connected with private owners' wagons who are uncertain as to the precise nature of the business of a British wagon finance company, and it was with a view to avoiding misconception that Mr. E. Duncan Taylor, when presiding recently at the annual meeting of the Lincoln Wagon & Engine Co. Ltd., made a clear statement on the subject. Naturally his remarks were concerned primarily with his own company, but broadly they are applicable to many of the large wagon finance concerns. He said that the principal business of his company was that of letting railway wagons and motor vehicles on hire with the option of purchase, and that his company neither built nor repaired railway rolling stock or road vehicles. The business was, in effect, that of a merchant banker, who accepted money on deposit account or short term debentures and employed the funds so obtained in the purchase of railway wagons or road vehicles, which were let on hire subject to agreements giving the users the right of purchase for a nominal consideration at the end of the agreed period of hire. When money was cheap, rates of hire tended to fall, and the company in turn reduced the rate of interest which it was prepared to pay for new loans or renewals of existing debentures. In the circumstances it was not surprising that the net revenue from rents and other profits, after providing for administration expenses and general charges, showed a decrease of £1,462 on the figures for the previous year, but this decrease had been counterbalanced by the reduced charge for debenture interest, with the result that the profit for the year, exclusive of profit on sale of investments, showed an increase of £1,337, as compared with the year ended February 1, 1935.

* * * *

Co-ordination of Transport in India

Two important announcements were made in the Indian Legislative Assembly on February 27. Sir Frank Noyce, Member for Industry, stated that an amending Bill and rules dealing with road transport would be introduced during the coming summer session; and the Member for Railways and Commerce said that the Government was committed to the principle of the creation of a Member for Communications, and that in the ordinary course of events this new portfolio would be set up next year. He indicated, however, that a redistribution of duties between the Members of Council would be such as to avoid the creation of an additional portfolio before the Federation came into being. Both these measures are doubtless being taken with a view to the co-ordination of all forms of transport throughout the sub-continent, a proceeding already long overdue in order to bring supply down to effective demand, the unfortunately accepted policy of all governments today. But unless the control of road transport is effectively enforced by Provincial Governments, the desired effect may not be reached, for the railways will have to concede traffic to road interests, in some cases, without being assured of fair competition in others. It is true that the Provinces look to the Government of India—the owner of the railways—for substantial grants each year, and that, therefore, the Central Legislature eventually has the whip hand, but it is unlikely that it will bring such pressure to bear upon the Provincial Governments except as a last resort.

* * * *

World Power Conference

A handsome brochure outlining the scope of the Third World Power Conference and Second International Congress on Large Dams has reached us. The conference and congress are to be held in Washington concurrently from September 7 to 12. For discussion at the former, each of the participating nations have been invited to present 18 papers (which are to be previously circulated to the delegates). So much attention has already been devoted to the purely technical side of power development that the forthcoming conference is to concentrate upon " the more fundamental, and in many respects more important, problems of the relations of power resources, their development and use to the social and economic interests of the nation." For this reason the subject selected for this conference is " The National Power Economy." Papers must not deal with purely technical matters, for it is intended that the conference " shall appeal to the layman as well as to the engineer by dealing with the national power economy in terms of an appraisal of the economic and social consequences of what the engineer has done." Now

what the engineer has done is simply to harness the sources of power in nature; and because the layman has neglected to see that this power is directed to his use and convenience, it has become misdirected so that the comfort and security it should have ensured are absent, and instead there is widespread and utterly unjustified poverty and fear.

* * * *

1,048 Miles a Day

New long-distance high speed records are to be set up from June onwards jointly by the Chicago & North Western and Union Pacific Companies, and as a daily performance, whereas the six-car City of Portland diesel-operated train of the same railways has hitherto run only intermittently. Two new units, each consisting of ten cars, named the City of Denver, and operated by diesel-electric power, are to run daily, one in each direction, over the 1,048 miles between Chicago and Denver. The time of 16 hr. will represent a cut of 11¾ hr. on the best existing time from Chicago to Denver, and of 9¼ hr. in the opposite direction, and will demand an overall speed of 65·5 m.p.h. It will also, we imagine, be the first example in railway history of a train of any description running over a thousand miles daily throughout each week as a regular procedure. The formation of each unit will consist of three Pullman sleeping cars, a Pullman observation car, a dining car, two reclining chair cars, and three cars for baggage, mail, express, and the housing of the power plant. At present the fastest daily journeys in the world of comparable length are those of the Twentieth Century Limited of the New York Central, and the Broadway Limited of the Pennsylvania, covering 959 and 908 miles respectively in 16½ hr. each day, both steam-hauled. The Twentieth Century is thus booked at an overall speed of 58 m.p.h.

* * * *

G.W.R. Experiments with Partitioned Vans

As a development associated with the prevention of damage to goods in transit, some twelve months ago the G.W.R. decided to introduce partitions in a few covered goods vans. The partitioning of the truck space was arranged by means of movable boards inserted into slots fitted to the interior sides of the vehicles (apart from the space opposite the doors) at intervals of six inches. In this way it was possible to divide the interior of the truck roughly into thirds but to conform to loading requirements. The support thus given to easily damageable commodities such as eggs, soft fruit, and furniture—traffics which however carefully handled are in themselves inevitably susceptible to damage—has proved an important factor in counteracting much of the shock and displacement sometimes occasioned by transit oscillation, the starting and stopping of trains and the shunting of the trucks. Fifteen of these covered goods vans fitted with vacuum brake have been equipped in the manner described, and after exhaustive tests covering some hundreds of journeys it has been established that the greater security afforded by the use of the partitions ensures equally greater immunity from transit damage. So successful have these experiments proved that the company has decided to equip a hundred more of these vehicles to operate over its system between specific points appropriate to the traffics visualised. It will be seen from the illustration on page 451 that the partitions consist of six boards constructed in such a way that there is left a space between them for easy handling. When not required they are nested at the end of the truck. The device has the twofold object of reducing the company's compensation payments in so far as damage is concerned, and what is equally, if not of greater importance, to fortify the company's reputation for the safe conveyance of goods.

* * * *

Signalling on the Saar Railways

When the railways in the Saar district were placed under a separate management in accordance with the Treaty of Versailles, it became necessary to consider the adoption of uniform signalling arrangements, there being some important differences in this respect between the former Prussian and Bavarian (Palatinate) sections. This was successfully accomplished by following, as far as possible, the standards adopted by the first named lines. A good deal of work was occasioned by the establishment of new customs stations on the Saar borders, many signal boxes having to be enlarged and new ones erected. The apparatus on the Palatinate lines was mostly of an old type, and opportunity was taken to renew it, while lock-and-block was installed on some of the single-line sections formerly worked by telegraph. Power operated distant signals were put in at many places, and some all-power cabins brought into use, a few being operated entirely by alternating current. Electric lighting of signals and point indicators was extended. Considerable improvements in hump yard working were undertaken, and independent shunting signals, similar to those of the Reichsbahn, were installed, the designs adopted by that system being followed in all matters wherever practicable. The telegraph and telephone equipment, although improved in some respects here and there, was still of old design when the Saar lines reverted to the Reich on March 1, 1935, but steps are no doubt being taken to remedy these deficiencies as quickly as possible.

* * * *

Oil Burning Efficiency

The interesting discussion following the paper on "Oil as a Fuel for the Modern Locomotive" by Mr. W. L. Topham at a meeting of the South American Centre of the Institution of Locomotive Engineers (published in the latest journal of the institution) called forth some remarks on oil burning by Mr. P. L. Falconer. Mr. Falconer thought it necessary, in order to obtain a higher efficiency in burning oil in locomotive fireboxes, to abolish the use of steam for atomising, which although simple was far from efficient. First there was the consumption of the steam itself, given by various authorities as varying from 3 to 15 per cent. of the total steam produced by the boiler, and secondly the destruction of the vacuum in the firebox by this steam, which results in an increase in the power required to produce the draught. This point is often overlooked, and instead of increasing the diameter of the chimney to release the extra volume, the usual practice is to alter the blast pipe. To get the increased volume through the small chimney the velocity has to be increased, and the energy required increases as the square of the velocity. The reduction or modification of the blast pipe increases the back pressure, and it must not be overlooked that 1 lb. back pressure affects the M.E.P. more than a drop of 1 lb. in initial pressure, because it is effective over a greater percentage of the stroke. The speaker suggested that lowering the blast pipe and increasing the size of the chimney would be advantageous, it being remembered that in an oil burning engine there are no cinders to find their way into a low blast pipe. A further loss of efficiency is due to the higher temperature of the smokebox gases in an oil burning locomotive, and this means not only a greater volume of gas to be removed, but an actual waste of fuel.

Future of the South Wales Docks

SERIOUS concern has not unnaturally been manifested throughout South Wales as the result of the observations made by Sir Robert Horne regarding the future of the South Wales Docks at the recent annual meeting of the Great Western Railway. On that occasion, he referred to the almost negligible return now being earned by the company from its vast expenditure on this great chain of docks, questioned the justification, even on the grounds of public interest, for maintaining so many, and intimated that unless there was a substantial increase in the export trade in the near future, or a higher scale of dock charges, the company would have no alternative but to seek the sanction of Parliament to the concentration of the traffic at fewer ports. To the extent that Sir Robert's remarks may have been special pleading designed to impress the Government with the necessity for giving South Wales special consideration in connection with the establishment of works of national concern, they have been speedily answered by the statement in the House of Commons on March 2 that a site had been selected in South Wales for a new Government factory and that consideration was being given by the Air Ministry to the establishment of an aerodrome in the neighbourhood. Welcome as this intimation is, it can have only an extremely small bearing upon the fortunes of these docks as the following figures indicate. The ports of Newport, Cardiff, Penarth, Barry, Port Talbot, and Swansea are concerned very largely with the shipment of coal and the following statement shows how seriously their trade has declined since 1913:—

Year	Exports		Imports	Total
	Coal and Coke	Other Traffics		
	Tons	Tons	Tons	Tons
1913 ..	38,717,564	3,288,467	5,142,620	47,148,651
1923 ..	35,486,954	3,009,071	5,839,930	44,335,955
1929 ..	29,802,482	3,438,561	5,170,866	38,411,909
1930 ..	27,386,050	2,728,195	4,811,234	34,925,479
1931 ..	21,747,464	2,160,290	3,968,858	27,876,612
1932 ..	20,385,131	2,127,847	3,412,332	25,925,310
1933 ..	19,596,356	2,018,469	3,316,079	24,930,904
1934 ..	19,767,408	1,950,879	3,580,822	25,299,109
1935 ..	19,440,965	1,765,979	3,676,374	24,883,318

The extremely serious effect of this tremendous drop in trade upon the company's financial position is obvious and, in fact, the net revenue of the dock undertakings declined from £543,531 in 1929 to £46,683 in 1935. Apart from this factor, the reduction in the volume of trade through the ports naturally reduced railway earnings—both merchandise and passenger—very materially. In considering the question of the return on capital, it is necessary to remember that immediately the extensive chain of South Wales Docks came under the control of the Great Western Railway, steps were taken to modernise the whole of the property. A comprehensive scheme for equipping all the docks with hoists capable of dealing with 20-ton wagons was initiated and carried through, many improvements were effected in siding and storage accommodation to facilitate coal shipments, hydraulic power arrangements were remodelled, and new transit sheds, berths, and general cargo appliances were provided. Full advantage was also taken of the Development (Loan Guarantees & Grants) Act, 1929, to improve the docks. Schemes of modernisation of facilities and equipment were carried out involving considerable expenditure, and at the present time it is considered that the docks are able to handle double the tonnage now passing and deal with it more efficiently than in 1913. In fact, the facilities available today are greater, as a substantial portion of the important Alexandra South Dock at Newport was not opened until July, 1914.

Altogether a sum of over £21,000,000 has been expended on these docks in purchase price and capital expenditure since 1923, much of which was carried out in the expectation that trade would revive, but it will be seen that the return on this vast sum has dropped to the absurdly low figure of 0·02 per cent. This unsatisfactory result in 1935 is due primarily to the tremendous drop in coal shipments which has been occasioned by international policies, trade agreements, and currency difficulties. Certain trade agreements designed to assist the trade of the North-East Coast have injured South Wales by driving Polish coal to compete in Mediterranean markets formerly held by South Wales, and the exports to Italy have entirely ceased. The G.W.R. of course has no control whatever over these factors and although the company has made strenuous efforts to develop the import and export of general cargo, it has proved impossible materially to offset the huge loss occasioned by the decline in coal shipments. Every effort has been made to reduce expenditure and, in fact, this has been cut by about 25 per cent. since 1929; the gross receipts have declined by about 33 per cent. It is not possible to reduce expenditure further without impairing the efficiency of the undertakings, and as the traffic during the present year is declining even more rapidly than during last year, the company is being forced by circumstances to consider seriously the desirability of seeking authority to increase its dock charges or to close down a portion of the dock facilities which are so greatly in excess of present requirements. The first alternative may, of course, have serious reactions, but the naïve suggestion already mooted in South Wales that the receipts would be increased by a reduction in the level of the dock charges is completely disproved by past events, while the second alternative involves so many complicated issues that an early decision is improbable.

* * * *

Germany's Timetable Revolution

DETAILS of present-day high speed railway running in Germany, which appear on page 476 of this issue, give tangible evidence of the possibilities of diesel propulsion. Diesel railcar units in Germany are daily making 27 start-to-stop runs which are all of them faster than the fastest start-to-stop booking in Great Britain; four of the German runs are booked between stops at over 80 m.p.h., and one at 82·3 m.p.h., as compared with the 71·4 m.p.h. of the Cheltenham Flyer, or the 75·6 m.p.h. of the fastest steam-operated railway run in the world—over the Pennsylvania main line in America. Most notable of all, perhaps, are such overall average speeds as 72·6 m.p.h. for 360 miles, including five intermediate stops (the Fliegende Kölner), or 70·7 m.p.h. for 323 miles including seven intermediate stops (the Berlin-Breslau-Beuthen railcar), compared with the non-stop 70·3 m.p.h. of the Silver Jubilee over the 232 miles between London and Darlington. It may be argued, of course, that these are only light 100-seater units with buffet facilities, as compared with a luxurious seven-coach train affording full restaurant car accommodation; but experience in America is proving that there need be no limit to the size and length of a diesel-propelled train, should circumstances render diesel propulsion desirable; and the speeds achieved on test by the six-car City of Portland of the Union Pacific show that sustained high speed is as easily within

the reach of the diesel-propelled train as of the two-car German units.

Nevertheless it would be idle to contend that the advantage is entirely on one side of the ledger. That the German State Railway management has established speeds with diesel-driven cars with which until now steam has not competed, it would be idle to deny. But at the same time it is instructive to note that there is in Germany a growing demand for the further exploitation of the possibilities of steam traction, with a view to the encouragement of the use of coal—the same reason, that is to say, that prompted the London & North Eastern Railway to build the Silver Jubilee as a steam-hauled and not a diesel-driven train—rather than the introduction of an indefinite number of diesel railcars. What the railcars have achieved for the German business man is, of course, remarkable. To be able to travel to Berlin from a city as far away as Cologne—a distance only 33 miles less than from Edinburgh to London—arrive at midday, have seven hours in the capital for business, and be back in Cologne by midnight, is an astonishing commentary on the progress which has been achieved in the speed of rail travel. In making these remarks we are merely paying due tribute to the pioneer high-speed work of the diesel trains in demonstrating the practicability and establishing the popularity of fast inter-city services. It should not be overlooked that within the last few weeks Borsig and Henschel experimental streamlined steam locomotives have emerged triumphantly from their preliminary service runs and are now being introduced on certain of the diesel schedules. When adequate comparative operating results are compiled, valuable data will have been secured upon which it should be possible to make far more precise motive power estimates for high-speed service than heretofore.

But not only in the highest realms of speed has Germany revolutionised her timetables. It is in connection with the timing of the " D " class expresses, which carry first, second, and third class passengers, and at only a small express charge in addition to the ordinary fares, that the biggest general advance has been made. In every direction out of Berlin, this large contingent of express trains has been speeded up until, over all sections of the main line where speeds up to 75 m.p.h. are permissible, the average speed between stops has been raised to between 55 and 62 m.p.h. It is in the uniformity of this improvement that the German railways can show a superiority to anything that has yet been done in this direction in either Great Britain or France, in both of which countries the principal trains are reasonably fast, but the same could not possibly be said in general of the services which incorporate a number of intermediate stops. The nearest parallel that can be found in Great Britain, probably, to the present German " D " class standard is over the Great Central section of the L.N.E.R., with its short and sharply-timed point-to-point runs; but whereas these are for the most part with light formations of five, six, and seven coaches, similarly fast timings over short distances in Germany are now more or less standard—often a whole series in succession in the long-distance journey of one train—with substantial loads of ten or more coaches of heavy Continental stock. It can hardly escape notice, also, that no considerations as to time and trouble involved in timetable reconstruction have been allowed to deter the German railway administration, notwithstanding the ramifications of its enormous system, from the complete recasting of timetables which, in four successive years, has increased the mileage of high speed runs from one run. 30 miles in length, booked in 1931 at over 58 m.p.h. from start to stop, to 157 such runs, totalling in length 10,997 miles, in 1935.

Eliminating the Rail Joint

RAIL joints are the bane of the permanent way engineer's life. He has to maintain them in such a condition as to minimise both rail wear and the manual work involved in avoiding dipped rail ends. The longer the rails that can be laid, the fewer the joints, and the less their initial cost and the expense of their upkeep. Experiments are therefore being made with the object of finding out the maximum length of rail it is practicable to use. Already it has been established to the satisfaction of many railway engineers that the longest rail which can conveniently be rolled may be safely used. So far this maximum length may be taken as 30 metres (98 ft. 5 in.), which is now a standard rail length rolled in Germany. Practically all main line relaying in that country is now done with 30-metre rails. In Belgium too the longest rails the mills can turn out are used, and these vary, according to the equipment of the mills, up to about 30 metres. France is using 24-metre rails, and in Great Britain 90-ft. rails have been rolled and laid under exceptional conditions and experimentally. Beyond these lengths end-to-end welding has to be adopted, and, in reconditioning main lines in Germany which do not require relaying, the former standard 15-metre rails are welded together to form 30-metre lengths. This practice was begun in 1927 on an extensive scale, after several years of experiment. When the suburban line connecting Berlin with Wannsee, 11½ miles out, was electrified in 1933 it was relaid with 60-metre rails, two 30-metre lengths being joined end to end by the flash butt resistance method. Some years earlier, about 1929, experimental lengths of 60 metres, 75 metres, and 120 metres (393 ft. 8 in.) were welded up near Jungfernheide on the Hamburg line a few miles from the Lehrter terminus in Berlin. Longer continuously welded lengths of line are in existence in certain tunnels and on bridges in Germany, and elaborate expansion joints have been provided at their ends.

Most, if not all, of these welded lengths in Germany are of the latest standard type of Reichsbahn permanent way. The rails are flat-bottomed, weighing up to 49 kg. per metre (98 lb. per yd.), and are held in steel soleplates by means of bolts and nuts with spring washers, on the Geo system, the soleplates being fixed independently to wooden sleepers by four coach screws and to steel sleepers usually by welding. Between the foot of the rail and the soleplate there is a compressed poplar (or other hardwood) slip, the purpose of which is to soften the riding as well as to resist creep. In special cases rail anchors are used in addition, *e.g.*, on gradients exceeding 1 in 200, and where braking normally occurs. As a rule six anchors per 30-metre rail are used as a preventive of forward movement. The effect of these precautions is to hold the rails so firmly that no movement relative to the sleepers can occur. The permanent way in every case is well drained on a properly sloped formation and with ample broken stone ballast. The minimum depth of such in the middle of the track is about 12 in. below the bottom of the sleeper. The ballast shoulder extends to 2 ft. beyond the end of the sleeper and at that point is 2 ft. deep to the formation. Where clay is encountered a blanket of sand or ashes is laid between the clay and the stone ballast. The sleepers are mechanically tamped, and it is quite exceptional to find one not bearing firmly on its bed. In these conditions—and we emphasise the qualification—we understand that no trouble has been experienced, at any rate with lengths of rail up to 120 metres. It will be observed that the conditions mentioned are practically ideal and extremely unfavourable to any tendency of the rails to buckle under a rise of

temperature when they are not free to expand normally. An internal compressive stress is consequently set up in the rails, which then act as struts. Conversely, at low temperatures, when contraction cannot occur, there is a tensile stress. In an article on page 447 of this issue we describe the M. & L. type of fastening used by the Delaware & Hudson Railroad of the U.S.A., which has now adopted the policy of eliminating rail joints so far as it is physically practicable to do so. The experience recorded with this type of fastening shows that, as in Germany, no relative movement occurs between the rails and the sleepers. We regard it as of prime importance that, in addition to such rigid fastenings, the condition of the road bed is such as to provide uniform and maximum support to the sleepers in order that lateral rigidity may be secured. Flat-bottomed rails have a greater lateral resistance to buckling, weight for weight, than bull-headed rails, and they are probably more adaptable to a firm fixing to the sleeper, although with the use of steel keys to hold the bull-headed rail to the cast iron chairs it has been found that creep can be virtually eliminated, thus indicating that a perfectly firm fixing may be obtained. The German extra precaution of using rail anchors as well may, however, be a wise one.

Confirmation that facilities for expansion need not be provided as a safeguard against buckling on well maintained and firmly fixed track is given by numerous experiences. There was for example the well-known 5-mile length of line on the Lehigh Valley Railroad laid about six years ago in moderate temperature with the rails touching, yet which gave no trouble through hot summers. The experience of the German railways and the Delaware & Hudson has already been mentioned, and end-to-end welding has now been practised without any ill effect and on a considerable scale by the Victorian and the New South Wales Government Railways for the past five or six years. On both systems lengths of 225 ft. on straight and moderately curved lines are used, with decreasing lengths on curves sharper than 60 chains radius. Welding was first adopted on the electrified lines with heavy rails up to 110 lb. per yd., normally requiring bonding, but later long stretches through tunnels were undertaken, and by the end of last June, 39 track miles had been Thermit welded in New South Wales, and in Victoria about 63 miles. In most cases the welding has been done *in situ* or alongside the track by the Thermit process, but in Victoria 7 miles were welded into long lengths at the Melbourne depot and travelled considerable distances to the site. No trouble, however, was experienced in the transport of the long rails. The Thermit system of welding has so far been by far the most popular, but other methods have more recently been tried with good results. The fact that the transport of long rails has been shown to present no serious difficulties points to the extended use of electric flash butt welding for new rails. Where it is desired to weld up existing rails, and track possessions are difficult to arrange for the Thermit process, arc welding has been tried with a good deal of success. In Hungary for example a new type of arc welding has been used on a considerable scale, both on the local railways round Budapest and on the Royal Hungarian State Railways. Arc welding is also used successfully in South Africa and in South Australia. In Austria the Federal Railways have recently acquired a resistance welding plant for flash butt welding, and lengths of rail up to about 60 metres are, we understand, being laid in connection with extensions of electrification.

In this country experiments have been carried out by our main-line railways with lengths up to 420 yd. of bull-headed track in the open, and even longer lengths on the London Underground lines in tunnel. In the former instance the keys were tightened up at 60° F. and no sign of movement at expansion gaps at each end have been observed during subsequent cold weather. The German practice is to lay long rails only in moderate temperatures. In very hot weather the work is suspended, nor is it carried out when the temperature is lower than about 40° F. At the latter temperature the gaps allowed are approximately $\frac{1}{2}$ in. for 60 metre and $\frac{1}{4}$ in. for 30 metre rails. It should be stated that all the long lengths of rail mentioned above are in running lines, though not always in those carrying the fastest traffic; and they have, of course, been in positions where normally a fairly long life is expected, and not where rails have to be changed frequently. Relative first costs of welded and mechanically jointed track vary according to circumstances, but there should be a considerable saving in maintenance of welded track, provided all the proper precautions referred to above are taken; and the advantage in smoother and quieter running should in time become tangible.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The G.W.R. Annual Meeting

25, Victoria Street,
London, S.W.1.
March 2

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In your issue of February 28 you give a digest of my remarks at the annual meeting of the Great Western Railway, and report the Chairman as stating that I described the Dawlish deviation line as "an utterly unnecessary expense." May I say that the Chairman was in error in attributing that remark to me. It is not for me to say what development may or may not be necessary in the case of a great company like the Great Western Railway. I was concerned merely to illustrate my contention that a large part of the Government Guaranteed Loan would necessarily be expended upon projects which would not materially decrease existing expenditure. In that connection I instanced the new line which, as I pointed out, cannot replace the line that serves Dawlish and Teignmouth, but must necessitate expenditure additional to what is already required to keep the existing line in an effective condition.

Since I am referring to this speech may I add that a remark which I interpolated on the spur of the moment to the effect that "we live in days in which it is as natural to a director to carry proxies as it is for an American gunman to carry a revolver," was in the nature of a not too seriously intended generalisation. No one has a greater respect than I have for the boards of our railways, and no one appreciates better than I do the wonderfully good feeling that has always existed, and exists today, between the board of the Great Western and its stockholders. I say this because I think Mr. Leslie Boyce, who followed me at the meeting, misunderstood my remark, and it may be that others misunderstood it, in the sense that they gave it a definite application it was not intended to carry.

I am, Sir,
Yours, very truly,

ASHLEY BROWN
General Secretary,
British Railway Stockholders Union Limited

PUBLICATIONS RECEIVED

The Blue Book : The Electrical Trades Directory and Handbook, 1936. London : Benn Bros. Ltd., Bouverie House, Fleet Street, E.C.4. 9¼ in. × 6 in. × 2¾ in. 1,398 pp. Price 25s. 0d. net.—As well as the usual process of revision necessary to maintain for this directory its reputation as the standard British reference work of its kind, this year's edition has been subjected to a rearrangement of the matter contained in the handbook section. This is now presented in a more logical sequence which, it is hoped, will enhance its value to users seeking general electrical engineering information. The headings of this section comprise conversion and other tables, financial data relating to the electrical industry, a list of duties levied by foreign countries on electrical goods, summaries of the regulations applying to telegraphic, telephonic, and wireless communication, and a directory of organisations, technical institutions, and government departments. The directory of electrical trades is arranged alphabetically, geographically, and under products, with concluding sections of trade names and telegraphic addresses. A Dominion and Colonial handbook section, similar in arrangement to the directory pages of the British handbook, gives corresponding information regarding the Empire Electrical undertakings in the United States are listed alphabetically and under products. All sections and the subdivisions by products of the directory can be turned to in a moment by referring to the clearly lettered and durable index tabs attached to the appropriate pages.

The Application of Statistical Methods to Industrial Standardisation and Quality Control. By E. S. Pearson, D.Sc. British Standard Specification No. 600—1935. London : The British Standards Institution, Publications Department, 28, Victoria Street, S.W.1. 8½ in. × 5½ in. 133 pp. Folding plates. Price 5s. net ; post free 5s. 6d.—A characteristic feature of modern industry is repetition work, and the main object of this publication is to set out why statistical technique is needed, and what kind of assistance it can give, in such conditions. The value of statistical analysis in the control and standardisation of quality in industrial production is being widely appreciated, for it has been seen that methods developed to deal with the problems of the biologist and agricultural experimentalist are directly applicable to industrial problems also.

It is impossible to achieve exact "sameness" in reproduction, whether it be measured by linear dimensions, tensile strength, electrical resistance, or any other method. In all cases the recorded measurements will not be found identical ; the differences are not always due to errors in measurement, but exist in the things themselves. This variation calls for statistical methods in assessing the quality of a consignment of material from tests performed on only a portion of the consignment, particularly so when financial considerations limit the number of tests carried out. It is then of major importance to turn to the best account the information provided by those tests.

Electric Arc Welding Practice. By H. I. Lewenz. London : Crosby Lockwood & Son Ltd., Stationers' Hall Court, E.C.4. 8¾ in. × 5½ in. 126 pp. Illustrated. Price 8s. 6d. net.—Although arc welding is a new science, anyone unacquainted with its principles would be surprised at the scarcity of good books dealing with the subject. The reason is that the practical side is developing so rapidly that engineers, metallurgists and welders have got to feel their way. There is, therefore, a tendency for some welders to carry on without considering sufficiently the technical side of the process. This handy little volume supplies valuable assistance from this point of view. It explains as well as can be done without practical demonstrations, how a sound weld should be made, but further, the author draws attention to the important part played by expansion and contraction due to the high temperature at which the work is necessarily carried out. The resulting stresses are sometimes sufficient to cause fracture, and, therefore, one chapter in this book is devoted to an examination of the problem and methods of preventing its becoming serious.

On the whole, the arrangement of the book is good, but improvements could easily be made in places. For instance, many of the illustrations should be made clearer by the addition of further notes, as the text sometimes refers to figures without explanation. In one place the diagram shows a beam hogging, whereas the way the heat is being applied would make it sag. Again, although it is recommended, quite rightly, that welding should be done from left to right, in illustrating the sequence of welding for interrupted welding in stages, each part is shown done from right to left, although it is not at all necessary to reverse the usual practice.

In spite of these criticisms, the book has many excellent qualities which definitely outweigh the above. The author emphasises that before a job is started, the operator should first ask himself : "what is going to be the effect (1) of the heating of portions of the work whose movement is restricted, and (2) of the longitudinal and transverse contractions of the weld itself ?" The first chapter deals chiefly with welding processes other than by the electric arc, after which materials and types of electrodes are considered, and a short history of the development of the art is given. Types of joints and the correct method of making them form an important section of the work, and cast-iron welding is discussed. Applications, testing of welds, and equipment form three more chapters, but the last is more highly technical than the general standard of the book.

On the whole, this book should prove very useful, because without going into abstruse theory it tells the practical welder what happens when he is at work and so helps him to overcome many of his difficulties. At the same time it should be studied by designers. Its use is simplified by marginal notes and a well-arranged index.

Steel Production. — The Barrow Hematite Steel Co. Ltd., Barrow-in-Furness, has assembled into the form of a strongly bound and well-indexed illustrated handbook the specifications of the steels, steel products, and sections produced at the company's works. To mention but one of its activities, Barrow steel rails now have a world-wide reputation, founded upon the careful production methods which led the company to be among the first to erect a rolling plant primarily for this purpose. The handbook has a diary section and pages for memoranda, and a section of useful tables, including metric conversions and conversion factors.

High-Tensile Bronzes.—This publication of the Manganese Bronze and Brass Co. Ltd., Caxton House, Westminster, S.W.1, has been produced with the twofold object of providing data relating to physical properties and potentialities, and of illustrating the applications of high-tensile bronzes and brasses. The physical properties are set out in twelve pages of clearly arranged tables, in which are shown particulars of stress and elongation, hardness, specifications fulfilled, and typical uses. A further tabular section gives the necessary information for machining. The booklet is well illustrated throughout, and gives an excellent impression of the wide range of mechanical and structural purposes to which high-tensile bronzes, brasses, and other alloys are suited.

V-Rope Drive.—We have received from Fleming, Birkby & Goodall Limited of Halifax, an explanatory booklet dealing with the Veeteon V-Rope drive, a characteristic of which is an efficiency proved by independent test of 85 per cent. The booklet sets out with great clarity the principles for arriving at the correct specification of belting for any required conditions. The Veeteon V-Rope drive, it is pointed out, is a development of the well-known Teon flat belt and the V-shaped Teon rope, so that it represents an experience of power transmission accumulated in actual service over a period of forty years. The tension member of Veeteon is of strong cord, and is embedded in scientifically compounded rubber. Both are protected from external wear by a few plies of fabric.

THE SCRAP HEAP

Mr. Gilbert Szlumper, in his speech at the society's luncheon last Tuesday, suggested the following description as being appropriate for members of the RETIRED RAILWAY OFFICERS SOCIETY ROBUST RUBICUND OLD SINNERS

* * *

In the early railway age the method of stopping a train relied chiefly upon the driver in skilfully checking the speed of the engine. An early account of the New Castle and Frenchtown Railroad in the U.S.A. states that the braking of the train when near a station was done at a signal from the driver by raising his safety valve. Then the old coloured servants (slaves) would rush to the train, seize and hold it back, while the station agent would stick a piece of wood through the wheel spokes.

* * *

The passenger station and general offices of the Canadian Pacific Railway at Winnipeg, together with their contents have been destroyed by fire The loss is estimated at £40,000, a portion of which is covered by insurance.—*From the "Canadian Gazette" of March* 4, 1886.

* * *

Waverley station and hotel, Edinburgh, in the valley which divides the old and new towns, occupy a site which came into prominence in early times when the old town of Edinburgh began to develop to such an extent that it was found necessary to erect a bridge across the valley. The bridge, however, did not become an accomplished fact until the reign of George III. At that time the valley was the scene of the Nor' Loch extending westwards for fully a mile. The Loch was ultimately drained, and in 1772 the first North Bridge was opened for traffic. Waverley station, which now occupies an area of 23 acres (11½ of which are under glass), dates back to 1846 when on June 22 of that year it was opened for public traffic on the occasion of the first passenger train leaving for Berwick-on-Tweed. From the basement to the top of the flagstaff on the tower of the hotel building the height is about 290 ft.—210 ft. from Princes Street Level, or a few feet higher than the adjacent monument to Sir Walter Scott (200 ft.). The hotel was opened on October 16, 1902.—*From an article by F.W.L. in the "L.N.E.R. Magazine"*

* * *

FORBIDDEN LOCOMOTIVES

In THE RAILWAY GAZETTE of May 10, 1935, we outlined the history of the Newcastle & Carlisle Railway on the occasion of its centenary of opening, and then referred to the period during which locomotive traction was compulsorily suspended. Now, through the courtesy of the York Railway Museum authorities, and Mr. E. M. Bywell, the Curator, we are enabled to reproduce two interesting documents concerning that period. A company was formed in 1825 to promote this railway, but the Act (10 Geo. IV, cap. 72) was not obtained until May 22, 1829, when construction was authorised of a line from Newcastle to Carlisle with branches to Alston and Swalwell (a total mileage of 78½), which were to be worked by horse power. It became evident during the construction that horse power would be inadequate on this, the longest railway up to that time projected in Great Britain. Accordingly, a Bill was introduced into Parliament to cover the substitution of steam locomotives, but on March 9, 1835, before the Bill was passed, the first section of the line was opened between Blaydon and Hexham, 16¾ miles, and steam traction used without Parliamentary power. Actually, a certain amount of horse-drawn mineral traffic had been conveyed from November 26, 1834. The introduction of locomotives—with a formal opening ceremony which caused considerable local excitement—was speedily followed by action on the part of a local landowner who obtained an injunction which closed the line temporarily. The statement of the railway directors is one of our illustrations. Later this landowner withdrew his objection and thereby bowed to popular feeling. On May 9, 1835, the Newcastle & Carlisle Railway was opened for regular traffic, as advertised in our second illustration.

* * *

An American tourist disembarking at Port Sudan on a certain Monday, finding that he had missed the mail train, asked the stationmaster on duty for a timetable, which was handed to him. As it was printed in Arabic he was unable to understand it, and he, therefore, asked the stationmaster when the next train would leave and was told at 9 o'clock on Thursday. He replied, "Say boss, I guess its a calendar you want and not a timetable."

NEWCASTLE UPON TYNE AND CARLISLE

RAILWAY.

THE Directors of the Newcastle upon Tyne and Carlisle Railway Company announce to the Public, with deep Regret, that they are compelled to discontinue, for the present, the Use of Locomotive Engines At the Time when this great Work, The Newcastle and Carlisle Railway, was originally projected, the Locomotive Engine was of rude Construction, and its practical Utility being doubtful, a Clause was inserted in the Act, prohibiting its Use The Improvements which have since taken Place in the Construction of those Engines have removed all reasonable Objection to them; and have established the Fact that no Railway can be enjoyed beneficially by the Public without the Use of the Locomotive Steam Engine Under these Circumstances, the Directors determined to apply to the Legislature for the repeal of the Restrictive Clause, and, in the mean Time, with the Concurrence of the Land Owners, with one Exception, they have used Locomotive Steam Power on that Part of the Line which has been opened. One Individual insists upon the Prohibition being enforced against the Company, and has obtained an Injunction of the Court of Chancery for that Purpose. The Directors therefore have no Alternative but to give up the Use of the Railway, and wait the Result of their Application to the Legislature.

Newcastle upon Tyne, March 28, 1835

Akenheads, Printers, Newcastle

Reproduction of a poster in the York Railway Museum concerning the compulsory withdrawal of locomotives from the Newcastle and Carlisle Railway

NEWCASTLE AND CARLISLE RAILWAY.

THE DIRECTORS of the NEWCASTLE UPON TYNE AND CARLISLE RAILWAY have the liveliest Satisfaction in announcing that Mr Bacon Grey, yielding his legal Rights to the Feeling of the Public, in a Manner highly honourable to himself, has abandoned his Injunction by which the Company is restrained from using Locomotive Engines, and has withdrawn his Opposition to the Bill now before Parliament.

In Consequence of this satisfactory Arrangement the Use of the Railway will be resumed on WEDNESDAY FIRST, from which Day the Company's Trains of Carriages will set out at the Hours formerly announced, viz. From Blaydon and Hexham each Day at 8 and 11 o Clock in the Forenoon, and 2 and 5 o Clock in the Afternoon. For the present the Trains will not travel on Sundays.

MATTHEW PLUMMER,
CHAIRMAN.

Newcastle upon Tyne, 4th May, 1835.

Brumbells Printers Newcastle

With "liveliest satisfaction" the directors of the Newcastle & Carlisle Railway announced that locomotive traction was being resumed by arrangement with the dissentient landowner

OVERSEAS RAILWAY AFFAIRS

(From our special correspondents)

SOUTH AFRICA

New Mineral Line

In terms of the South Africa Act, the Railways and Harbours Board has submitted a report to Parliament recommending the acquisition of the private railway from Postmasburg to Beeshoek and the construction and equipment of a line from Beeshoek to Lohathla, with a connection from Driehoekspan to Kapstewel, a total distance of twenty-seven miles, including the four and a half miles of private railway, at an estimated cost of £117,359.

On the instructions of the Government a beginning has already been made with the construction from Beeshoek northwards with the object of facilitating the development of the manganese ore fields and enabling the companies to increase their output and to execute their overseas orders.

Agreements with Mining Interests

Early in 1929 the British Swiss International Corporation Limited was formed for the exploitation of the manganese deposits, and the railway administration entered into an agreement with this corporation for the construction, equipment and working of the railway from Koopmansfontein to Postmasburg (65½ miles). On the other hand the corporation undertook to provide the necessary funds and to guarantee the administration against any loss on the working of the line for a period of ten years. This agreement was subsequently assigned to the Manganese Corporation (1929) Limited, which corporation was required to deliver to the railway administration securities to the normal value of £100,000. The Manganese Corporation, however, owing to various contributory factors, failed to meet its obligations under the agreement which provided for the despatch over the line of 200,000 tons of ore during the first year and not less than 350,000 tons per annum during each subsequent year of the period of ten years.

The agreement further provided that no facilities were to be placed at the disposal of any other applicant for placing on rail manganese ore or products, except upon acceptance of certain financial obligations in respect of the cost of construction, equipment and working of the line.

Equal Facilities for Different Interests

Strong representations were made by other manganese concerns to utilise the line, but protracted negotiations with the corporation failed to produce a satisfactory solution of the position. Ultimately, however, the Anglo-Transvaal Consolidated Investment Co. Ltd., of Johannesburg, agreed to take over the liability of the corporation. The agreement with the corporation was cancelled and the securities lodged by the corporation were retained by the administration. With the cancellation of the agreement equal facilities were provided for all users of the railway.

The high-grade deposits in the district are estimated at 3,700,000 tons in addition to which there are less valuable deposits amounting to approximately 6,500,000 tons. Estimating the world's consumption of manganese ore at about 3,500,000 per annum, it is considered that South Africa with its high-grade ore should be able to obtain an annual share of at least 500,000 tons.

INDIA

Accidents

On the morning of February 8, a goods train, which was shunting, collided with a motor bus at a level crossing near Kolimaran (E.I.R.) about three miles from Giridih. There were 27 passengers in the bus, of whom four were killed and 15 injured. Three wagons of the train were derailed.

On the evening of February 7, a B.-N.R. mixed train encountered a heavy cyclonic wind on the Raipur-Dhamtari (2 ft. 6 in. gauge) branch and capsized. The guard of the train and a few passengers received slight injuries. The track was soon cleared and through running resumed.

New Steel Rolling Mill in Bengal

It is significant that the new rolling mill of the National Iron and Steel Co. Ltd., which was officially set in motion by the Commissioner of the Burdwan Division, Bengal, in January, is manned by Japanese engineers, and equipped with the most up-to-date Japanese machinery. Its capacity at present is about 10,000 tons of rounds and flats annually, but when fully equipped it will be capable of turning out about 60,000 tons of structural steel and railway materials yearly. The construction of an open hearth and electric furnace is also now in hand, and is expected to be completed in 1937.

In the past Japan has purchased considerable quantities of scrap from India, and turned it into good steel, but this industry will now be carried on in India by the Indian firm owning the new mills, though 30 per cent. of the capital is said to be in Japanese hands. The venture is under the patronage of the Government of India and the Railway Board,, which also had encouraged it. Rails and sections have been supplied to Indian railways and structural firms for railway work for many years past by the Tata Iron & Steel Company of Tatanagar, which, with other well known Indian firms, is able to supply the great bulk of the needs of those railways.

ARGENTINA

Public Works Programme: 1936

The Ministers of Finance and Public Works have agreed upon the national programme of Public Works for the year 1936, the total amount involved being some 120 million pesos, in which the principal items are:—

	$ Paper
State railways	36,500,000
Sanitary works	19,000,000
Navigation and ports	21,569,500
Architecture	20,908,000
Irrigation	6,125,718
Studies in Riachuelo improvements (Buenos Aires South Dock)	1,950,000

The Summer Holiday Season

Most of the railways are at present very busy dealing with their summer holiday traffic, which is now at its peak. Chief of these are the B.A.G.S., which serves Mar del Plata and other South Atlantic beach resorts, as well as the beautiful Lake district (in conjunction with the State Railway); the Central Argentine, whose main line passenger income at this time is mostly derived from Córdoba and its famous hill district; and, in a lesser degree, the Buenos Ayres & Pacific Railway, which caters for Mendoza, the Andine region and Chile. Intelligent propaganda on the part of each of these railways, as well as tourist agencies, such as the Villalonga Company and the *Expreso Internacional*, is reflected in the continuous growth of the holiday habit amongst Argentines, and the expanding receipts accruing to the transport companies therefrom. Radio propaganda is allowed from microphones in Argentina, and some of the railways have not been slow to use this excellent medium to advantage, whilst all the companies mentioned have issued most attractive booklets and posters emphasising the claims of the holiday resorts they serve.

Long-Distance Monopoly

It should be mentioned that, up to the present, owing to the lack of uniformly good roads over long distances, competition from road motor vehicles has not been felt to any extent, and in this connection it must be remembered that the two principal holiday resorts, Mar del Plata and Córdoba, are, respectively, 247 and 431 miles from Buenos Aires. The work of surfacing the main road between Buenos Aires and Mar del Plata—which runs parallel with the B.A.G.S., and often alongside it—is, however, proceeding apace, and will be ready for use next summer, when strong competition with the railway by omnibuses and motor coaches is certain to ensue. One or two lines run

at present, but as an hour's rain is sufficient to put part of the route out of commission, this form of transport to and from South America's greatest seaside resort is far from being popular.

Railway Signal Engineers

At the recent annual meeting of the Institution of Railway Signal Engineers (South American branch), Mr. W. E. Tremain took the chair. After the report and treasurer's statement had been presented, the following committee was elected for 1936: Chairman, Mr. F. E. Goss; Vice-Chairman, Mr. J. L. Partington; Secretary and Treasurer, Mr. J. Runnett; Members: Messrs. C. Redman, C. F. B. Whitlock, and F. Diez. The meeting was followed by the annual dinner.

The Frederick Harvey Trevithick Prize

Much satisfaction is felt in Argentine and Uruguayan railway circles at the honour done to Mr. J. R. Sedgfield, A.M.I.Mech.E., A.M.I.Loco.E. (South American Centre), who has been awarded the Frederick Harvey Trevithick Prize, for the 1934-35 session, for his paper entitled "Machine Tooling Methods and Machine Shop Reorganisation," which was presented and discussed at the meeting of the local Centre at Pérez (Central Argentine Railway) in December, 1934. The Council of the South American Centre trust that this recognition from headquarters will be an incentive to the younger members to prepare papers of interest, for discussion at future meetings. Mr. Sedgfield is in the Chief Mechanical Engineer's Department of the Central Uruguay Railway.

CHILE

Strike on the State Railways

During the first week of February, the State Railways were the scene of serious labour disorders similar to those which occurred in January last year (as reported in the Overseas columns of THE RAILWAY GAZETTE for February 15 and March 8, 1935), but on a more extensive scale and marked by considerable violence. The ostensible cause of the trouble is said to be the refusal of the railway authorities to accede to any further demands for increased wages, on the grounds that the employees have already been very liberally treated in this respect, and that in any case, the financial position does not permit of any further concessions of this nature at present.

It is believed, however, that the motives behind the movement were partly political, as for some time past, Communist agitation has been rife among certain sections of the workmen, and the Government recently ordered the railway administration to dismiss from the service a number of permanent way gang foremen suspected of subversive activities. Apparently this action on the part of the authorities brought matters to a head, and on February 3 it was announced that the workers in the third and fourth zones, between Talca and Puerto Montt, had declared a strike, which was followed by numerous acts of sabotage. Telegraph and telephone wires were cut at many points, and rails and sleepers pulled up, with the result that numerous trains were derailed with, in one case, at least, some loss of life. It is stated that between San Rosende and Concepción, a considerable stretch of line was destroyed by dynamite.

Railway Battalions in Charge

In accordance with the regulations provided for such emergencies, Colonel Manuel Campos was appointed Military Director of the State Railways, with full powers, troops from the railway battalions being detailed to take charge of the trains, while flying squads armed with machine guns were organised to patrol the line and protect bridges and other vulnerable points. These measures had the effect of limiting the disturbances to the southern zones, and the northern sections were not seriously affected.

The employees of the North Longitudinal Railway remained aloof from the movement, as did the majority of those in the second zone, which includes Santiago and Valparaiso, thus enabling a fairly normal service to be maintained in this important section, although, as a measure of protection, the night trains were temporarily suspended. On February 8, it was announced officially that the Government had dominated the movement, which had virtually collapsed, and that on most of the lines the trains were running normally. Owing to the prevailing unrest, it was stated, however, that the Government had decided to declare martial law throughout the country.

HOLLAND

The Motor Road Question

The Netherlands Association for the Construction of Special Motor Roads held a general meeting recently at which the Chairman reviewed the situation and outlined the policy of his society. Proposals for a special motor road from Amsterdam to Rotterdam were put forward in 1923, according to the Netherlands press, but the request for a concession was refused by the Government. The speaker referred to the large number of persons killed and injured on the present roads, and the advantage to be derived from providing special tracks for the bulk of the motor traffic. He advocated the viaduct form of construction, and suggested that if the scheme were to be worked out in conjunction with the railways, the latter would find a means of recovering from their present difficulties. The costs of construction could be recovered in several ways without recourse to special tolls on these roads. A plan for 1,000 km. (620 miles) of roads, to cost about 400 million florins (£54 million at the present rate of exchange), and to take 3 years to build was explained by the speaker, who declared such work to be more profitable and a greater help in meeting unemployment than the continuation of reclamation work on the Zuider Zee. To avoid interfering with the waterways traffic, and for national defence reasons, it was proposed to pass under them in tunnels.

The speaker concluded by recommending that the work should be done by private enterprise. The suggested network comprises the following routes:—

Neuschanz via Groningen to Amsterdam, Rotterdam, and towards Antwerp.
Amsterdam to Utrecht.
The Hague and Rotterdam to Roermond and Maastricht.
Utrecht to Bentheim and to Arnheim.
Groningen to Roermond and Maastricht via Apeldoorn, Arnheim, and Nijmwegen.

These roads would have suitable connections with adjoining countries.

Dissolution of the Patijn Commission

The Government has announced the dissolution of the Commission on Transport Matters established by Royal Decree on May 12, 1923, generally referred to as the Patijn Commission, after the Chairman's name. Its task was to ascertain what measures were advisable in order to make the various means of transport serve public requirements in the most economic manner. Three publications have been issued as a result of its investigations. The first appeared in 1924 and advocated the adoption of regular concessions for motorbus services, a measure put in force two years later. The second, issued in 1930, dealt with the regulation of motor goods services, and the last, in 1932, with the establishment of a national transport board of supervision. It is probable that another report prepared in 1935 on shipping dues will also be printed, but others on the Twente-Rhine canal, &c., may not be published.

Another commission, set up to investigate the financial relations obtaining between the State and the various district tramways and light railways, and presided over by Mr. A. H. W. van der Vegt, a retired Inspecting Officer of Railways and Tramways, has also been brought to an end. It made recommendations regarding the preservation of certain lines which were required in the public interest, and assisted in working out the scheme of amalgamation for the tramways in Brabant and Gelderland.

SWEDEN

Forest Fires and Sparks from Engines

According to statistics published by the Department of Forests for the year 1934, there were 31 cases of fires caused

by sparks from locomotives. There were in all 221 cases of fire, and therefore 14 per cent. were attributable to railway working. Although the number of fires in that year was double the average figure for the period of twenty years 1914-1933, the average due to locomotive sparks was still approximately in the usual proportion, as in those 20 years 15·5 per cent. of fires were due to this cause. The area affected by forest fires in 1934 was 2,324 hectares (5,740 acres) and the cost of making good the damage and of extinguishing the flames was more than 400,000 Kr. (over £22,000).

SWITZERLAND

Federal Railways Report

The report of the General Management of the Swiss Federal Railways for the fourth quarter of 1935 has just been issued. The following figures are extracted from it, those for 1935 being approximate:—

	1934 Fr.	1935 Fr.
Receipts:		
Passenger traffic	133,214,665	126,047,510
Goods, livestock, luggage and mail	188,041,785	176,518,040
Various	12,330,407	11,802,710
Total receipts...	333,586,857	314,368,260
Working expenses (not including expenditure covered by renewal funds and other special funds, as for new works and rolling-stock)	235,517,527	228,501,890

Single-phase current produced by the Federal Railways power-stations:	4th quarter 1934 kWh.	4th quarter 1935 kWh.
Amsteg - Ritom group	64,054,000	80,424,000
Vernayaz - Barberine group ...	46,752,000	46,574,000
Massaboden ...	2,980,000	979,000
Total ...	113,786,000	127,977,000
Current received from other power-stations	28,890,000	27,819,000
Total ...	142,676,000	155,796,000

New Rolling Stock and Other Improvements

New rolling-stock delivered during the fourth quarter of 1935 included: 2 lightweight diesel railcars (see the *Diesel Supplement* of January 24, 1936, p. 186), 8 light tractors for station shunting service, 12 8-wheeled coaches, 42 covered goods wagons, 24 ballast and service wagons.

Of the various works completed or in hand, the following may be mentioned: Enlargement or alterations at Geneva, Neuchâtel, Zurich, Olten-Hammer and several smaller stations; new electric signalling at Zurich and Brugg; installation of electric block signalling on the Landquart-Chur, Mühlehorn-Flums and Eclepens-Ependes sections; and equipment of automatic train control apparatus on the Berne-Bienne, Berne-Olten-Zurich, Bienne-Olten and Basle-Brugg lines.

Considerable progress has been made in the construction of the Etzel power-station and of new roads and viaducts in connection with the artificial lake which will be formed in the Sihl valley, near Einsiedeln. The power-station is designed for a yearly output of 156 million kWh. The electrification of the Gossau-Sulgen and (Bellinzona-) Giubiasco-Locarno lines is approaching completion.

DENMARK

More Light Railways to be Closed

The Minister of Transport proposes to order the closing of further sections of light railway, particularly those between Ringsted and Frederikssund, and Röde Kro to Bredebro, some 95 km. (59 miles) in all. The annual losses are considerable, and it had been proposed to close these lines two years ago, but the decision was postponed as it was hoped that the public could be induced to make more use of them, a hope that was not realised. By closing the lines not only will the great expense of working them be saved, but the rails, sleepers and steelwork of the bridges will be recovered for use elsewhere, and the foreign exchange difficulties will be somewhat eased thereby.

CHINA

New Branch Line in Kwangtung

The Ministry of Railways has approved the construction of a branch line to Yungkong to serve coal mines to be opened there. Funds for the construction of the line are to be raised by the Kwangtung Provincial Government.

Hwainan Railway Opened

As anticipated, the Hwainan Railway was opened throughout its 220 km. length for coal and goods traffic on November 20, and for passenger traffic on January 1. As well as bringing coal to the port of Wuhu, it will open up the middle of Anhui province and carry its passengers to the city of Wuhu, which has a population of about 140 000.

MANCHUKUO

S.M.R. Loan and Subsidiary Undertaking

Mr. Matsuoka, President of the South Manchuria Railway, has secured a loan of Y.35,000,000 (over £2,000,000), for the company's new enterprises, from the Industrial Bank of Japan. In a recent interview he said that his company would soon launch out upon the large-scale production of aluminium as one of its subsidiary activities.

South Manchuria Railways Loan

The South Manchuria Railway issued in January Y.30,000,000 (about £1,750,000) of debentures, at par, redeemable after 13 years, bearing interest of 4·3 per cent. per annum. The loan, to be known as No. 48 Issue, is the first instalment of the Y.90,000,000 provided for in the budget.

Accident in Extreme Cold

A temperature of 50° under zero caused several rail fractures on the North Manchurian lines, the former Chinese Eastern Railway. A passenger train from Pogranichinaya to Harbin was derailed due to a broken rail, at a point 3½ miles east of Imienpo on the afternoon of January 19. The engine and the first six coaches left the track but remained upright, the ten following 4-wheeled carriages fell down the embankment and were damaged beyond repair. One passenger lost his life and 25 were injured.

New Railways

The following new lines and extensions have been scheduled for 1936, and construction is to be started forthwith:—

Noho–Nonchiang (Mergen), 91 km. (56½ miles), an extension of the Tsitsihar–Noho line.

Mishan–Hulin, 166 km. (103 miles), an extension of the Linkow–Mishan line.

Taipingchuan–Lupei, 174 km. (108 miles), a branch of the Ssupingkai–Tsitsihar line.

Meiho–Tunghua–Tsian, 248 km. (154 miles), a branch of the Mukden–Kirin line to the Korean frontier.

Yihsien–Hsinchiu–Hsinlitun, 131 km. (81½ miles), a connection between the Jehol and the Tahushan-Chengchiatun lines.

The estimates for the construction of these lines aggregate 85 million yen (appr. £5,000,000).

JAPAN

Government Railways Revenues

The revenues for nine months ending December 31, 1935 of the Japanese Government Railways show noteworthy improvements over the correponding period last year.

April-December, 1935		Inc. over 1934, per cent.
Passengers, &c.	Yen 228,496,000 (£13,400,000)	6·60
Goods, &c.	Yen 168,869,000 (£10,000,000)	5·20
Aggregate	Yen 397,365,000 (£23,400,000)	6·00

The statutory year of the Government Railways runs from April 1 till March 31.

Wintry Conditions on West Coast

The weather, unusually severe for these parts, has caused continuous traffic interruptions and several mishaps throughout January on the Government Railways, particularly on the West Coast lines in Honshu, the main island. The most serious of the accidents occurred on January 21, when a gang of about 200 workmen, engaged on snow clearing work, were caught by an avalanche at the entrance to a tunnel between Imajo and Sabanami stations on the Hokuriku main line (Maibara-Naoetsu). Most of the men escaped into the tunnel, but 50 were buried under the snow. The majority of these were eventually rescued more or less seriously injured, but 13 lost their lives outright.

FURTHER IMPRESSIONS OF OVERSEAS TRANSPORT

VI—On his return from Ladysmith to the coast at Durban, the author travels over the recently electrified Glencoe Junction—Cato Ridge section of the South African Railways

By A. W. ARTHURTON, M.Inst.T., formerly Secretary, British Railways Press Bureau

IT was rather a disappointment that I was not able, owing to its being the close season for game, to visit the Kruger National Park in the Eastern Transvaal, the great wild life sanctuary, 8,000 square miles in extent, where lion, elephant, giraffe, zebra, baboon, hippo, crocodile, and deer of an infinite variety may be seen at close quarters. The South African Railways run circular tours from Johannesburg and Pretoria during the winter months. The train is the home of the party for the nine days of the trip, but special motorbuses pick up the tourists at Crocodile Bridge to enable them to visit the haunts of the animals.

Our journey from Ladysmith to the coast was one of absorbing interest. Ladysmith is the popular starting point for the Drakensberg National Park, to which a railway motor service is operated, and in the distance could be seen the dim outlines of the giants of the Drakensberg Range. Beyond is the Protectorate of Basutoland, in which exclusively native territory no white man resides, save those who administer its affairs and a few permitted traders. The transport of the country is performed by ox or Basuto pony, the latter being able to climb like a mountain goat, and one meets parties of natives threading their way through the mountain passes with loads of wool and grain packed on these useful animals.

From Glencoe Junction, slightly north of Ladysmith, the power for the train over the succeeding stretch of 200 miles to Cato Ridge had changed from steam to electricity, and at Colenso is the great power station that supplies the energy. The country now became more rugged, and the twisting and winding of the train was more noticeable as it threaded its way through miles of wattle plantation and along the edges of the precipices until, far below, the city of Pietermaritzburg (or Maritzburg as it is more commonly called) appeared in the distance. Lying in a great cup-shaped valley on the banks of the Umsindusi River, with thickly wooded heights all round, it has a setting worthy of the capital of Natal.

The Natal Sugar Belt

This is a great agricultural and pastoral area, but sugar is king as far north as Matubatuba, 155 miles from Durban. The great sugar belt of Natal gives employment to many thousands of Indians and natives. Unlike some great industries, sugar production does not mar the beauty of the countryside, but the great expanse of cane adds a charm peculiarly its own. Climatic conditions affect the sucrose content of the cane, and the sub-tropic temperature of Natal is very suitable for its production. Some idea of the value of the sugar crop and its importance in the economic life of Natal may be gathered from the fact that over a million pounds' worth was exported in 1934, more than 200,000 tons being railed to Durban and shipped from that port.

From Maritzburg to the coast, signs of more intensive cultivation came into view. Each turn of the train brought into sight mango groves, banana plantations, a field of carnations, or the many beautiful flowering shrubs which are a feature of South African flora; here one begins to understand why Natal is called the Garden Colony. At Drummond a distant view was caught of the Valley of a Thousand Hills, and later, to the north, the sparkle of the Indian Ocean. There was still a drop of 2,000 ft. to the coast, and the track became even more tortuous and the scenery more tropical in character, but soon after breakfast the clamour of scores of hotel porters announced arrival at Durban.

Facilities on Express Trains

The express *trains de luxe* which run three times a week in each direction between Johannesburg and Durban are similar to the Union Express and Union Limited between Johannesburg and Cape Town. Slightly less than 500 miles separate Johannesburg from the coast, and the distance is covered in about 20 hours. The *trains de luxe* are composed of articulated first-class saloons, a well-appointed dining car seating 46 persons, and an observation car at the rear of the train which permits an unobstructed view of the country. The compartments are commodious and well-upholstered, and are provided with a constant supply of hot and cold water, also drinking water and tumblers. Shower baths, with hot and cold water, are fitted in each saloon. High-class catering is a feature of the *trains de luxe*, and excellent and inexpensive meals are prepared by experienced chefs and served by white stewards. Each train is under the supervision of a train manager, whose duty is to see that all services are performed to the satisfaction of the passenger. An attendant is stationed in each saloon to answer electric bells, and attendance includes boot cleaning and pressing of men's clothes and ladies' dresses.

Durban was reached on New Year's Eve. South Africa keeps the New Year with even greater festivities than Christmas, so that for nearly three days business was practically suspended and Durban disported itself on the Ocean Beach or on golf or race course. Durban is really a winter resort, but during the New Year period the many fine hotels along the ocean front were filled with Johannesburg people whose luxurious, high-powered cars, which make light of the 400-500 mile journey to the coast, crowded the streets. Northward the road leads to Zululand, traversing the Indian quarter of Durban. For some miles a series of bazaars lines the route, and a harmony of colour is added by the Indian women in their saris of blue, rose and yellow, and with gold studs in their nostrils.

The tramways are well managed, and are one of the most popular modes of conveyance on account of their cheapness and efficiency. The trolleybus is now being substituted on some routes. Another popular means of transport in Durban is the ricksha, drawn by a native in gaily-ornamented costume and feathered head-dress. These men are Zulus, and utter peculiar cries as they run along with loping strides. The fares are cheap, and the Durban ricksha man prides himself on his appearance and his never-failing smile. I was amused by the toy railway on the beach, which had faithfully copied South African railway practice by exhibiting a board giving the height above sea level and the distances from Cape Town and Johannesburg. There was also a notice that the train service to Abyssinia had been suspended for the present.

THE NEW CORNISH RIVIERA TRAINS OF THE GREAT WESTERN RAILWAY

Some further details relating to the design and construction of the vehicles

ON pages 60, 61, and 65 of the issue of THE RAILWAY GAZETTE dated July 12, 1935, there appeared a brief illustrated description of the new trains for the Cornish Riviera service of the Great Western Railway. By the courtesy of Mr. C. B. Collett, Chief Mechanical Engineer of the company, we are able to supplement this article by some further details respecting the constructional features of the vehicle comprising the trains, and the methods of assembling the more important components.

The formation of each train is as shown below, the last three coaches being used for strengthening purposes:—

	No. of Compartments	No. of Seats	Tare Weight Tons	Cwt.
Brake Third	2	16	31	16
Third	7	56	32	8
Third	7	56	32	8
Third Dining Saloon ..	—	64	32	8
First Dining Saloon and Kitchen	—	24	39	18
Composite	3–3rd, 4–1st	24, 24	32	12
Brake Third	2	16	31	16
Third	7	56	32	8
Brake Composite	3–3rd, 2–1st	24, 12	33	7
Brake Composite	3–3rd, 2–1st	24, 12	33	7
Composite	3–3rd, 4–1st	24, 24	32	12
Brake Third	2	16	31	16
Brake Composite	3–3rd, 2–1st	24, 12	33	7

The seating accommodation of the ordinary train is 408, and with strengthening coaches, 508; the dining cars seat 88 passengers (24 first class and 64 third class). The total weight of the train of 10 coaches is 332 tons 8 cwt., and of the 13 vehicles, 430 tons 3 cwt. All the coaches are 60 ft. long with overhanging bow ends, and by taking full advantage of the G.W.R. loading gauge are 9 ft. 7 in. wide, so that more capacious seating arrangements are made possible. The window glazing, except in the drop lights, is flush with the outside panels, and this, with the absence of any projections, gives a clean exterior finish to the coaches and reduces wind resistance.

Body Construction

The bodies are completely encased in steel plating, thus considerably strengthening the main structure, which is of timber, chiefly of Empire origin. The steel plates which form the roof sections are rolled to shape and riveted together longitudinally on a toggle lever riveting machine fitted with a travelling jig, each section being the length of one compartment. They are then assembled on the coach body, and lap riveted together; the under sections are screwed to the hoopsticks. The side panels are screwed to the body framing and lap jointed on the bottom light rail. The screw holes in the panels are punched with a special tool which forms recessed holes to receive the counter-sunk sherardised screws, and small grooves are milled in the body-members to take these recessed holes. To allow free circulation of air and reduce the risk of condensation on the steel panels, holes are bored in the body frame members. All the side pillars are lapped into the bottom sides and secured to them by steel box brackets held by bolts.

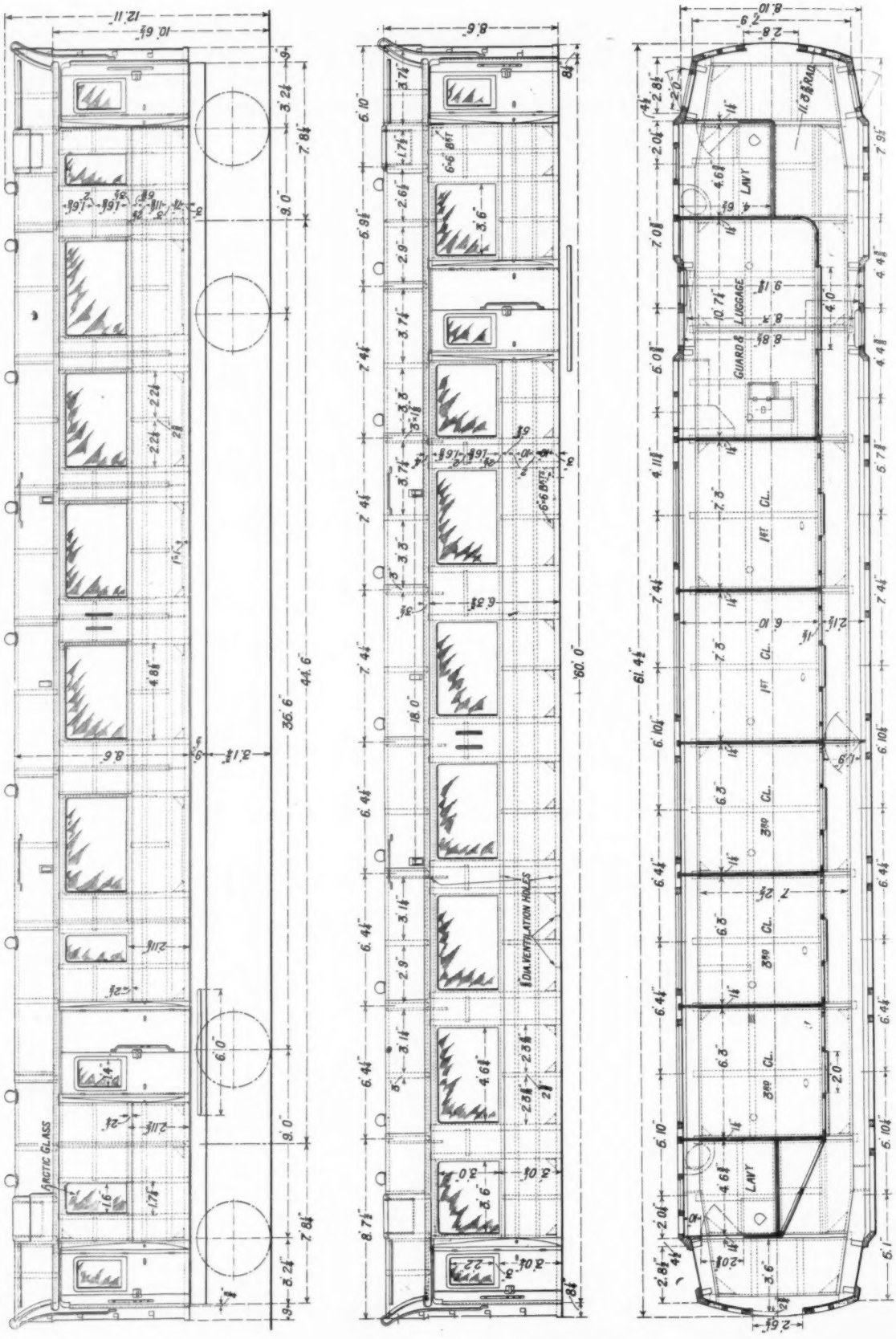
The bottomsides and cantrails are milled correctly to shape in one operation. A specially built machine has recently been installed for dealing with these members; this machine cuts the splices and allows the complete length of bottomside to be assembled. The machine is provided with slotted steel bars and stops for positioning the cutter heads, thus obviating the necessity of marking off each individual member and ensuring accuracy of milling. The machine is capable of trenching the bottomsides to receive the side pillars, recessing the doorways, mortising for floor bars, and boring any bolt or coach screw holes required, either horizontally, vertically, or at an angle. The doors are of simplified design, the members being milled to shape, reducing the handwork to a minimum, and are assembled on a combined hydraulic cramp and jig. A single steel panel with pressed window opening greatly increases the rigidity of the door. The floorbars are tenoned into the bottomsides and secured by large steel box brackets. Fireproofed boards are laid on the floor members and covered with a jointless fireproof composition. As the bodies are bow-ended, only a short gangway is required, and this is the G.W.R. standard type, fitted with corrugated rubber mats. The bodies are insulated from the steel underframes on which they are carried by felt covered elm pads.

Underframes and Bogies

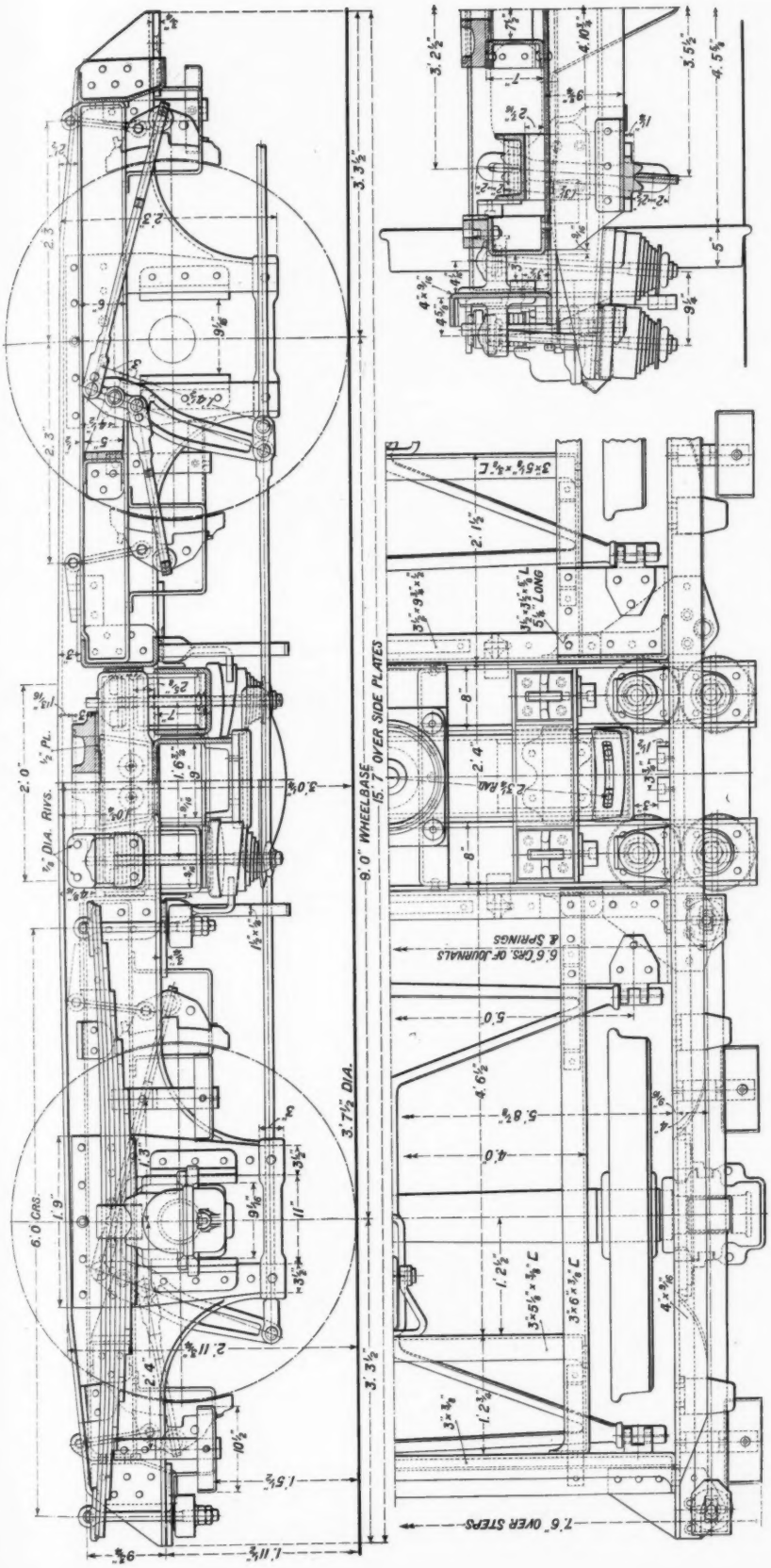
The underframes are constructed of rolled steel sections and are mounted on pressed steel double bolster bogies of improved design to ensure steadiness in riding. The bogies have a wheelbase of 9 ft. and are built up of steel plates flanged in hydraulic presses. The boxed ends of the pressed members facilitate easy assembly and riveting, and eliminate all angle brackets. All component members are jig drilled and assembled on erection jigs which ensure the correct alignment of each member. In one jig, the headstock, transom, and longitudinals are riveted together with gusset plates and brackets for brakework. Two such units then pass on to another jig, on which the sideplates, axleguards and hornblocks have already been mounted; the whole is then riveted up, and is ready to receive the bolster. The bolsters are also built up of pressed sections, the centre casting being mounted on the centre bolster which is supported from the main bolster by slings. Brackets riveted to the sideplates carry bronze cups, which engage the cone washers mounted on the eight suspension bolts supporting the main bolster. Free movement of the bolster is thus ensured and rubber stops fitted to the sideplates and centre bolster prevent any excessive oscillation. The fitting of the springs to the bolster is simplified by the use of a special hydraulic appliance which compresses all eight springs at one time, allowing the split nuts to be fitted to the suspension bolts. The complete frame and bolster are then placed on the wheels and the brakework coupled up.

Interior Appointments

In the first class compartments some very effective colour schemes have been introduced; all the panelling is of light quartered oak relieved by walnut inlay, with an oval mirror placed at the centre of each side of the compartment, the figure and grain of the oak panelling serving to enhance the rich colouring of the upholstery. The upholstery is different in each coach, figured repps



Elevation and plan drawings showing details of body construction. New Cornish Riviera train, Great Western Railway

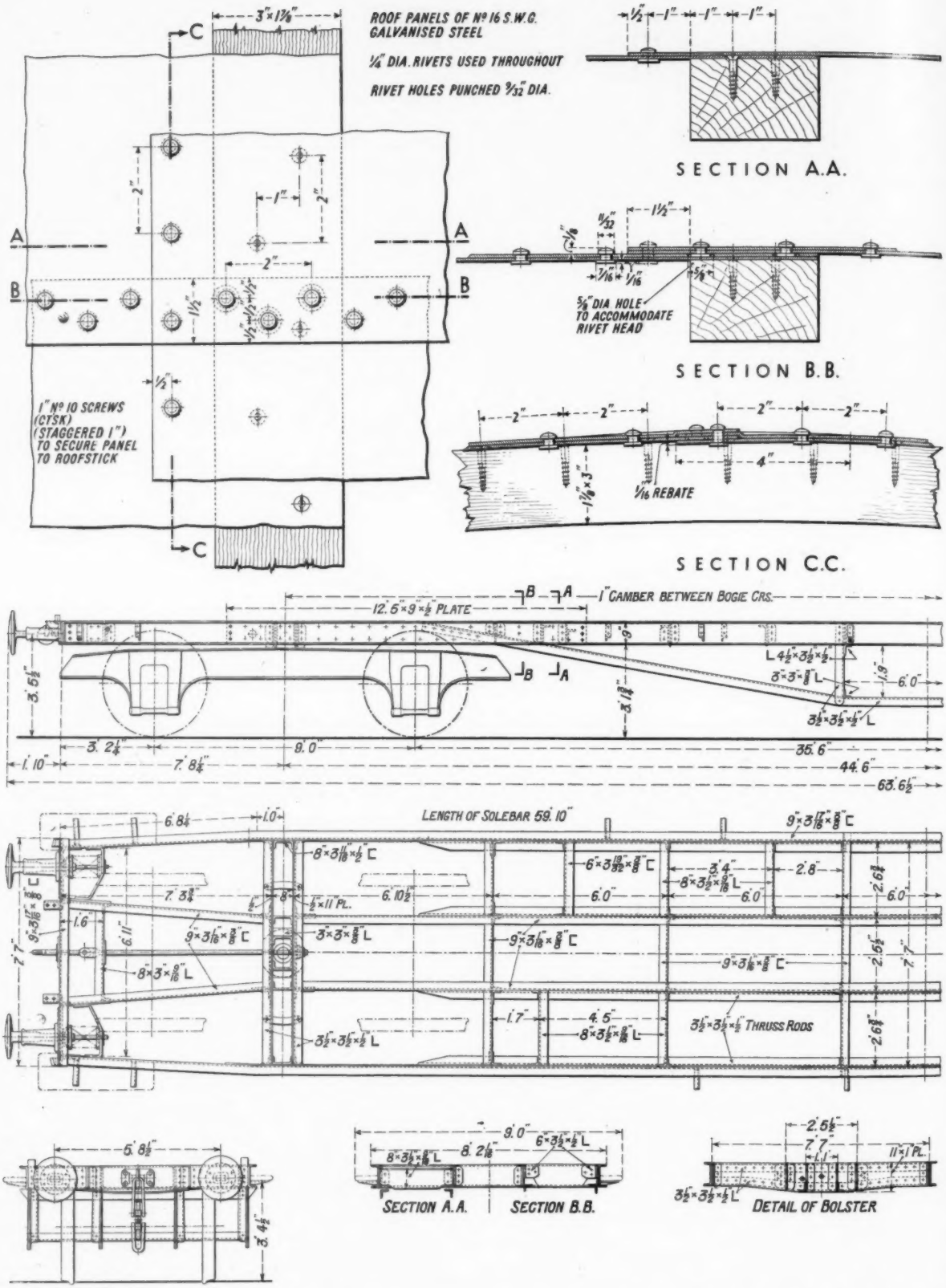


Cornish Riviera coaches, Great Western Railway, bogie details

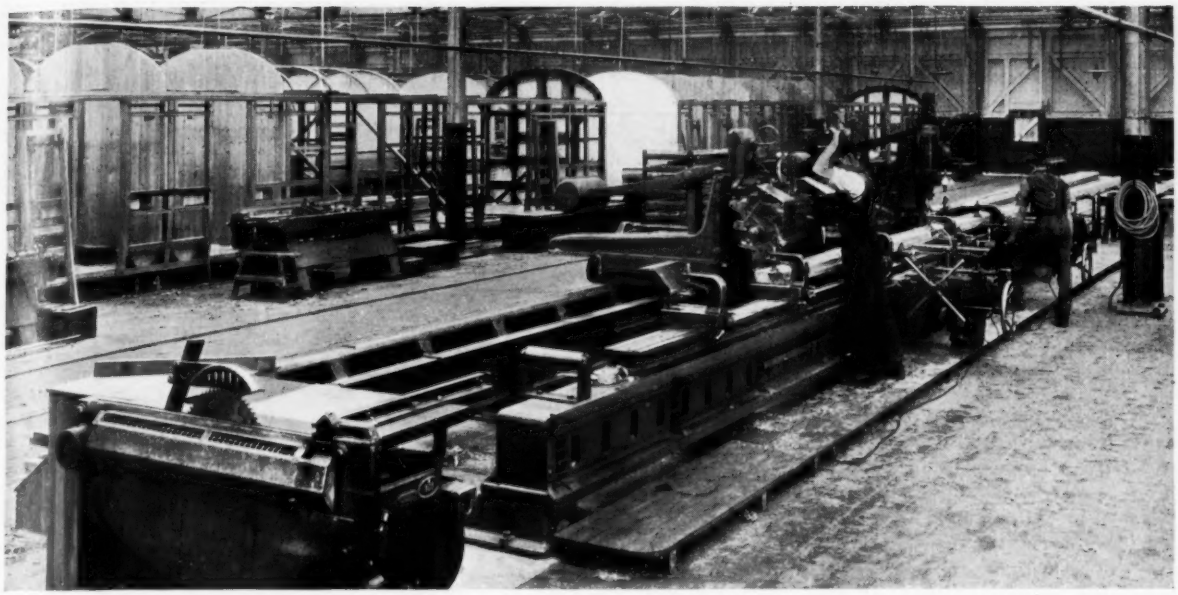
and moquettes being chosen in blue, green, and brown colours, which harmonise well with the panelling. The seats, which have been specially designed, are very comfortable. The seat backs and loose cushions are spring filled, and headrests with antimacassars and hinged arm-rests are fitted to each. Plain cork linoleum laid on felt is the floor covering, and figured Wilton pile carpets, matching the upholstery, are placed between the seats.

The windows on the corridor side of the compartment are fitted with Rexine blinds of the appropriate colour, whilst on the other side rayon curtains of gold and green, blue, or brown complete a very tasteful scheme. Everything possible has been done to give a flush clean finish, there being no superfluous mouldings or grooves in the panelling. The blinds are recessed into the corridor partition; a flush electric light switch is fitted, and the communication chain has been recessed into the cantrail, leaving a short exposed length for a "pull" above the window. The windows, which are of ample size, are of the balanced drop type. The compartments are heated by steam radiators, one of which is fitted beneath each seat; the temperature is under the control of the passengers. The semi-elliptic ceilings are given a stippled vellum finish and carry four electric light fittings, as well as the usual roof ventilator. All the fittings have an oxidised copper finish, which tones well with the decorative scheme. The vestibules and corridors adjoining the first class compartments are very spacious. They are panelled in light oak with walnut inlay. Wilton carpets matching the upholstery are laid on the linoleum and felt floor covering.

In the third class compartments, all the panelling is of gaboon mahogany with walnut inlay. The seats are upholstered in figured brown moquette, a material which tones well with the panelling. An unusual effect is introduced by the seat backs, which are fluted, and with the loose spring-filled cushions complete


ROOF PANELS OF Nº 16 S.W.G. GALVANISED STEEL
¼" DIA. RIVETS USED THROUGHOUT
RIVET HOLES PUNCHED 9/32" DIA.
1" Nº 10 SCREWS (CTSK) (STAGGERED 1") TO SECURE PANEL TO ROOFSTICK
SECTION A.A.
SECTION B.B.
5/8" DIA HOLE TO ACCOMMODATE RIVET HEAD
SECTION C.C.
1/16 REBATE
1" CAMBER BETWEEN BOGIE CRS.
12'6"×9"×½" PLATE
LENGTH OF SOLEBAR 59'10"
3½"×3½"×½" THRUSS RODS
SECTION A.A.
SECTION B.B.
DETAIL OF BOLSTER

Cornish Riviera coaches, Great Western Railway. Above: Details of panel jointing for roofs, and (below) details of underframes



Trenching, boring and recessing machine for carriage bottom, sides and cant rails

a very comfortable seat. An oval mirror is placed on each side of the compartment, and the richness of the gaboon mahogany panelling provides a pleasing effect.

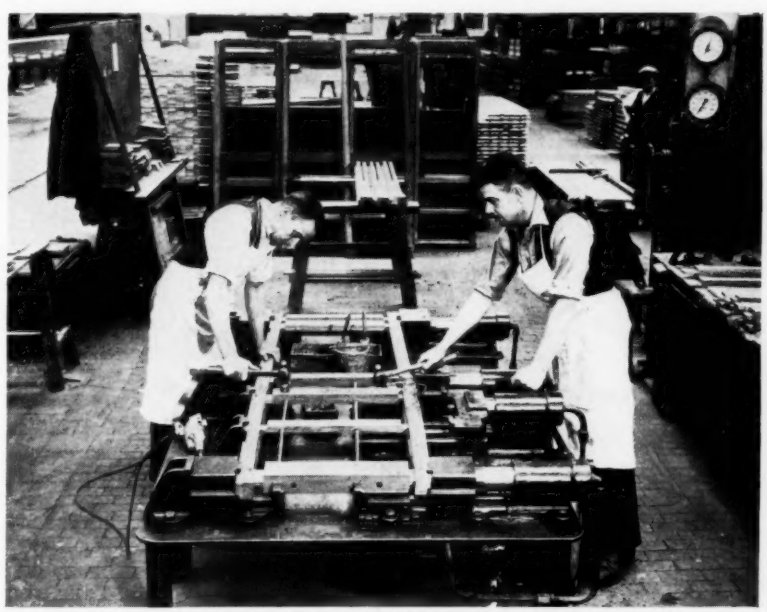
Plain linoleum laid on felt covers the floor, and brown horsehair rugs are placed between the seats. Brown Rexine blinds are fitted to the windows on the corridor side, and brown and gold rayon curtains screen the large windows on the other side of the compartment. The compartment is lighted by three roof lights. Other fittings and equipment are similar to the first class compartments. The third class vestibules and corridors are panelled in gaboon mahogany with walnut inlay; brown horsehair carpets are laid on the linoleum and felt floor covering. Baize covered tables are provided in each carriage, and can be fixed in any compartment if required.

The lavatories are spacious and light, the walls being painted sycamore above the waist and light oak or gaboon below. The composition floor is dark green. The usual equipment is supplemented by a glass shelf for toilet articles.

Dining Car Arrangements

The first class restaurant car includes a dining saloon in which the seats are arranged in groups of four and two on either side of the gangway. The seat ends, which are fitted with hinged armrests, are made of quartered oak inlaid with walnut to match the panelling. The seats are upholstered in figured brown repp and have loose spring-filled cushions. The floor covering is parquet linoleum laid on felt, with brown Wilton carpets laid in the gangway and Wilton rugs beneath the tables. The baize topped tables are of oak. The kitchen which is separated from the pantry by a serving vestibule, is panelled with stainless steel, and the equipment includes gas stove, plate warmer, and hot water circulator for supplying hot water to the sinks in the kitchen and pantry. The two refrigerator cupboards provided are cooled by an electrically operated refrigerating plant carried under the coach. The pantry contains accommodation for the storage of china, cutlery, &c., in addition to wine cupboards, sinks, and serving tables.

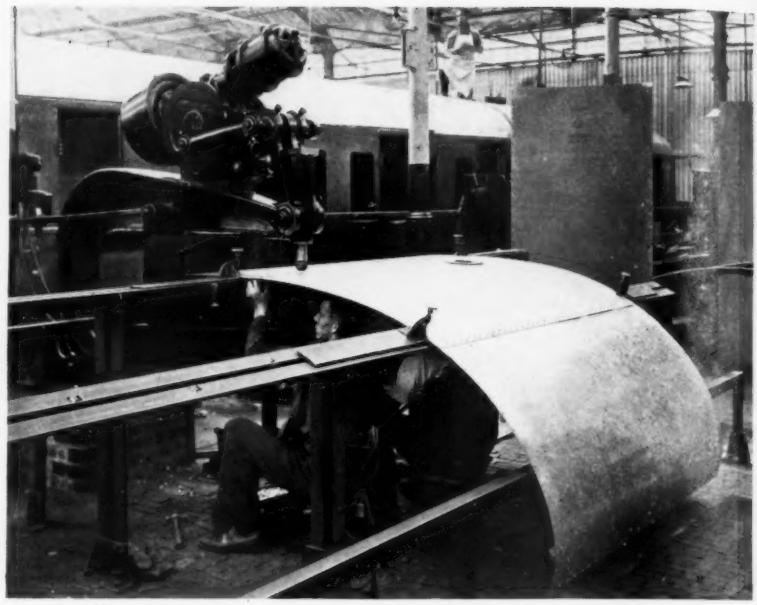
In the third class dining saloon the seats are arranged in groups of four on either side of a central gangway. The seat ends are of gaboon mahogany with walnut inlay to match the panelling. The seats, which are upholstered in brown moquette, have fluted backs and tip up spring-filled seats. The saloon is divided by a central partition



Assembling carriage door with hydraulic jig and cramp

which is fitted with oval mirrors. The floor covering is of parquet linoleum laid on felt, and a brown horsehair carpet is laid in the gangway. The tables are of gaboon mahogany with baize covered tops. This carriage also provides further accommodation for stores and the clothing of the dining car staff.

The dining saloons are heated by steam pipes which run along the body side and are covered by a grille of suitable design with oxidised copper finish.



Right: Riveting carriage roof panel for the new Cornish Riviera trains of the Great Western Railway

Two New Herbert Dieheads

IN order to extend the scope of the Herbert patent Tangic self-opening diehead introduced a few years ago, Alfred Herbert Limited, Coventry, has just introduced the first of a range of new dieheads which will be made in four sizes, namely $\frac{5}{8}$ in., $\frac{7}{8}$ in., $1\frac{1}{4}$ in. and 2 in. These will be known as the Tangel diehead, a stationary or by a cam on the machine, which rotates the front closing ring until two hardened detent pins engage with two hardened bushes, thus locking the head rigid in the closed position.

The Tangar diehead (Fig. 2) is closed either when stationary or when rotating by means of a yoke or other

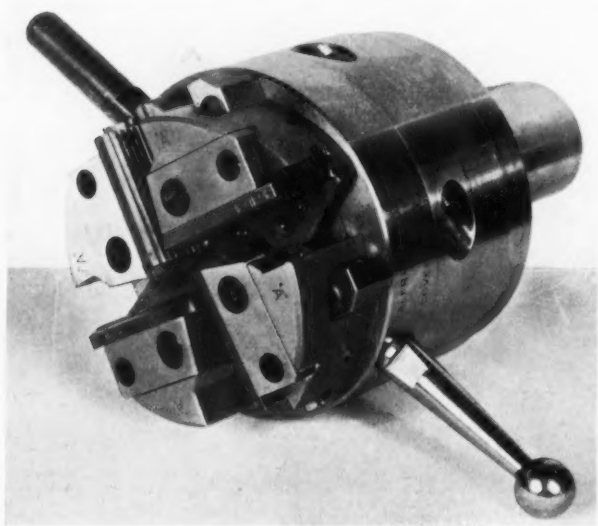


Fig. 1—Herbert Tangel diehead

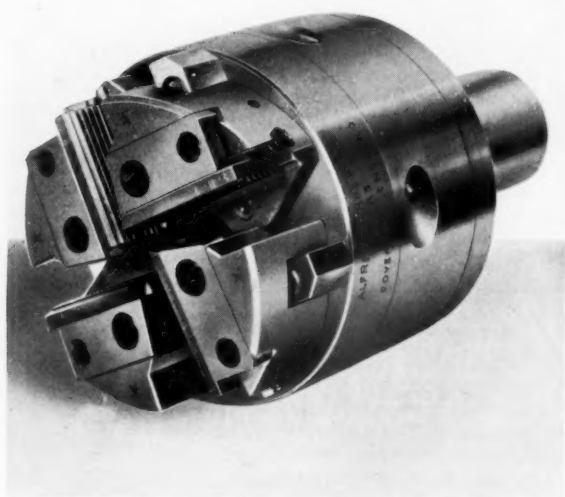


Fig. 2—Herbert Tangar diehead

type for use on capstan and turret lathes, and the Tangar diehead, a rotating type for use on single and multi-spindle automatics, drilling, and other types of machines in which the diehead is carried on a rotating spindle. Both dieheads are of the self-opening pull-off type, opened by arresting the travel of the turret slide or the threading spindle. The Tangel diehead (Fig. 1) is closed by hand abutment operating against the rear part of the diehead. Each type of diehead can readily be converted to the other by small alterations. Setting of the dies in the diehead is simplified by the use of the micrometer setting gauge. An adjustment graduated to 0·001 in. enables the dies to be set to a definite amount above or below centre to suit the material being cut.

LONG WELDED RAILS

An American railway to abolish rail joints. Precautions to ensure safety

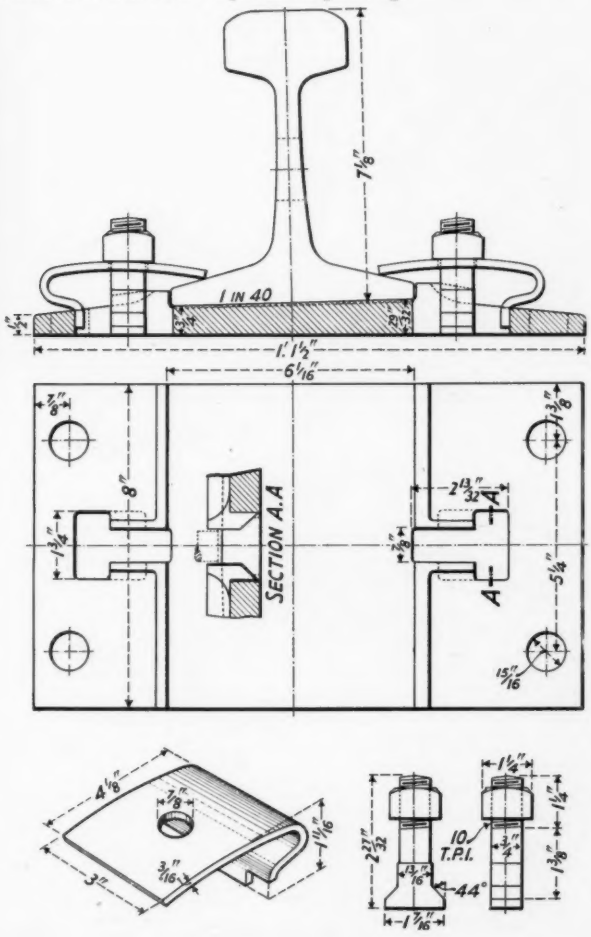
BY the kindness of the President of the Delaware & Hudson Railroad, Mr. L. F. Loree, who has sent us a copy of a paper presented on January 22 to the Maintenance of Way Club of Chicago by Mr. H. S. Clarke, Maintenance of Way Engineer, Delaware & Hudson Railroad, we are enabled to give an account of the current permanent way practice of that company. It may be recalled that in our issue of February 15, 1935, we recorded the fact that on the Delaware & Hudson certain experimental lengths of main line track had been welded into continuous lengths up to a maximum of 2,700 ft. at Albany during the summer of 1935, and at Mechanicville in the summer of 1934. So successful have these installations proved that the Delaware & Hudson Railroad has decided to eliminate rail joints altogether so far as is practicable, having regard to switches and crossings and track circuits. The latest installation, in which continuous rail lengths of as much as 6,970 ft. have been laid, is near Schenectady.

131-lb. rail held to soleplates by M. & L. spring clip fastenings. Note independent fixing of soleplates to sleepers

In his paper Mr. Clarke summarised the well-known disadvantages of rail joints, which, in North America where very heavy axle loads are the rule, are apt to be a source of greater expense in permanent way maintenance than in this country. An idea of the importance of the rail joint has been given by the Committee on Economics of Railway Labour of the A.R.E.A., which in various studies estimated that about 45 per cent. of the labour in track maintenance is devoted to keeping the rail joint in proper line and level.

Mr. Clarke regards a rail as like a gas, which, if allowed to remain at the same pressure, changes in volume in direct relation to changes in temperature. If, however, it is confined so that it cannot move or expand it increases its pressure with an increase in temperature. Similarly rails which are free to move may expand considerably in summer and contract in winter. If the rail, laid in moderate weather, is held fixed in position by outward forces such as adequate fastenings to the sleepers, ample ballast to provide sufficient frictional resistance to prevent the sleepers moving, and so on, it will subsequently be stressed internally, the metal being in tension in cold weather and in compression in hot weather, but the carrying capacity of the rail will not be modified.

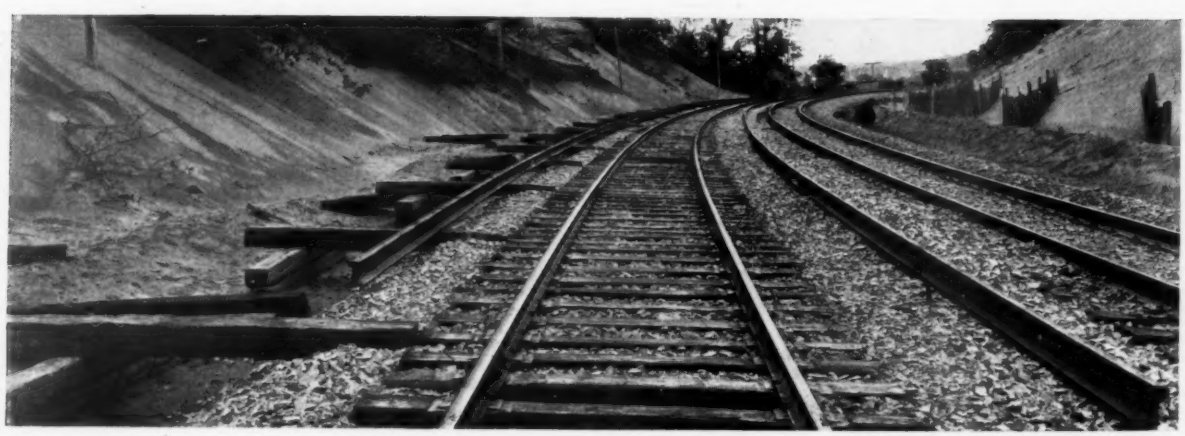
On the Delaware & Hudson, M. & L. rail fastenings are used. To a double shouldered soleplate secured to the sleeper by screw spikes are bolted two spring clamps which bear on the base of the rail, pressing it down with great force yet allowing a certain amount of flexibility necessary for the normal wave motion of the rail under the action of the rolling loads which it must support. The clamps, which replace the usual spike for holding the rail in place, exert a force of about 2,500 lb. each which tends to prevent creep. Since the rail-to-soleplate fastening is independent of the fastening of the latter to the sleeper, each group is free to perform only the work it is designed to do, while the rail, the soleplate, and the sleeper are incorporated into one strong but elastic and flexible unit. Both the vertical motion of the rail and of the sleeper are greatly decreased compared with the old method of fastening, and it has been found that this means a lessened pounding on the ballast structure beneath the sleeper and a consequent reduction in the amount of attention required in packing.



M. & L. type rail fastening details

131-lb. rails welded into 1,400-ft. lengths in transit to site of relaying

Unloading the long welded lengths at site



Long welded rails ready to be laid

The original installations of M. & L. track were laid in winter with the standard expansion gaps at the joints. The following summer it was noted that this rail had not closed up, and in the succeeding year the expansion gap was halved. Still the rail did not close in hot weather, and after that the rail was laid tight. In Mr. Clarke's experience where rail is so fixed, as in M. & L. construction, that it cannot expand into an extended position when heated and cannot move in any other way, as, for instance, by buckling, it must remain unaltered in size, since the external force holding it is greater than the compressive stress set up by the temperature rise. Alternatively, if the rail cools below the temperature at which it is fixed, a tensile stress is created to be resisted by the influence which fixed the rail.

If the tendency of track to buckle under rises of temperature with long rails is still regarded as a danger, Mr. Clarke points out that the difficulty can be entirely eliminated either by allowing the track to take its set in its expanded position in the extreme hot periods, or by welding the track in hot weather. Thereafter the only inherent stress will be a tensile stress which will be greater in the cold months, but as it is far below the elastic limit of the rail steel it will not be sufficient to affect the service strength of the rail.

The method of welding so far mostly used on the Delaware & Hudson Railroad is the Thermit pressure type. This is a fusion weld on the base and about halfway up the web, the rest of the web and the head being a pressure weld. To effect this combination weld, the base and web of the rails to be joined are cut back $\frac{1}{4}$ in. with an oxy-acetylene torch to a distance of $1\frac{1}{2}$ in. from the underside of the railhead in order to provide ample space for the entrance and fusion of the Thermit metal with the rail metal. The ends of the rails are also cut on a bevel from the top backward into the rail a distance of $\frac{1}{32}$ in. at the base. When the rails are set up for welding therefore the heads are in tight contact and a gap of $\frac{1}{2}$ in. is provided between the adjacent webs and bases.

The rails are first clamped together with the ends slightly raised to obtain proper line and surface. They are then pre-heated with petrol burners, and when a temperature of from 1,700° to 1,800° F. is reached the Thermit, which consists of iron oxide, aluminium and slag, is ignited. In about 20 seconds, a temperature of 5,000° to 5,500° F. being reached, the molten metal is poured into a mould which has been clamped round the rail ends prior to the pre-heating. The metal is sufficient to fill the mould to about halfway up the web, and the slag which results from the reaction fills the remainder of the mould over the top of the rail.

The metal round the base and web melts the rail so that the whole becomes a molten mass. The slag round the head of the rail and the upper part of the web raises it to a welding temperature of about 2,100° F. in about three minutes, when the ends are pulled together approximately $\frac{1}{4}$ in. by drawing up the heavy clamps, thus producing the high pressure necessary to perfect the butt weld.

Finished jointless track on the Delaware & Hudson Railroad

After the two types of welds have been made simultaneously the joint is stripped of its mould and ground to bring the head of the rail, at the point which has been upset by the pressure weld, to the line and surface of the adjacent rail.

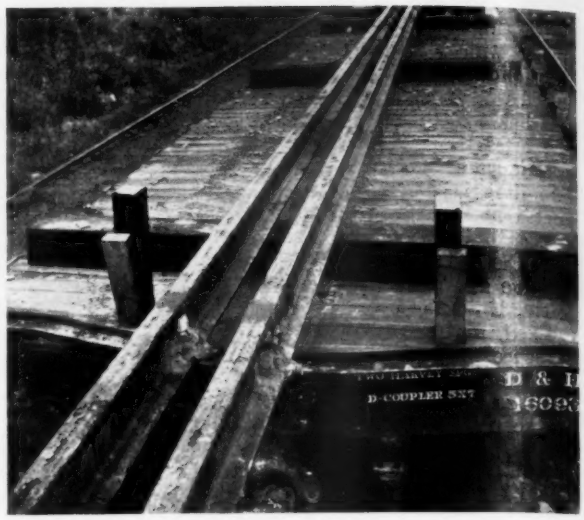
In his paper Mr. Clarke mentioned that his company had also used to a small extent electric flash welding (this process was described in THE RAILWAY GAZETTE of (April 28, 1933). Briefly, this method depends on continuous arcing between the rail ends. The two ends of the rails are fixed in the welding machine by clamps connected to the terminals of a low voltage transformer. One of the clamps is movable, and the faces are brought sufficiently close to form an arc, which, about two minutes after starting, produces heat sufficient for welding. The faces are then brought together under a heavy pressure which squeezes out all the metal that is molten and the weld is made. This method, unlike Thermit welding, is not practicable in the track, and in the Delaware & Hudson experiment 39 ft. rails were welded in lengths of three at the General Electric Company's works at Schenectady and transported to the track where they

were further joined into long lengths with Thermit welds. The most remarkable installations to date of long welded rails on the Delaware & Hudson consist of four continuous rail lengths, two 6,970 ft. long and two 4,435 ft. long. They were welded together into 20-rail lengths on flat cars three miles from the site of their installation to which they were transported on the cars. The rails were of the 131 lb. standard section and were prepared at the rail mill ready for the welding process, the rail heads together with the upper 1½ in. of the webs being machine faced to assure clean true surfaces for joining and to avoid the necessity for carrying out this operation by hand on the site. The normal fishbolt holes were replaced by a single hole 13½ in. from each end of the rail, which was used as an anchorage for the clamps necessary to produce the welding pressure.

Two strings of rails, blocked up on sleepers and about 2 ft. from the sides, were mounted on the cars. The joins were made from one end, two welds being in progress at the same time, one in each of the strings of rails. An average of 20 welds a day was made when the work was in full progress, with two men making the sand moulds; one part-time man with an oxy-acetylene torch undercutting the rail ends below the head for the fusion portion of the welds; one man cleaning the rail ends; two men aligning the rail, adjusting the sleepers at the joints, and fixing the clamps; two men placing the moulds; two men making the welds, including the operations of preheating, pouring, stripping and moving their equipment forward; and two men rough grinding the rail head at the welds.

After welding, the rails were barred over to the centre of the cars about 3 in. to 4 in. apart so as to be subjected to the minimum movement in transportation round curves. End stakes were provided at about every third car to keep the rails in position, but otherwise no sort of fastening was made, nor had experience in transporting the rails even through curves of about 500 ft. indicated the necessity for any fastening since there was practically no movement of the rails on the cars.

On arrival at the site, the rails were barred off opposite sides of the cars by a gang of 14 or 15 men who accomplished the task in from 10 to 15 minutes without difficulty. To prevent the ends of the long rail lengths whipping off the cars they were held to the nearest running rail by loops of chain of sufficient length to restrict the lateral throw of the welded rail to the distance desired from the running rail. An alternative method of lifting the end of the rail off the cars was to use a ditcher-derrick.



Welded rails loaded on trucks ready for transit

The rails, as will be seen from one of the illustrations, were unloaded in such a way that they could be easily barred over to position in the track. The joints in the track at the ends of the long lengths of rail were Thermit welded.

The experience gained from this trial installation demonstrates the advantages of welding into long lengths prior to laying the rails in the track, and opens up the way to the use of the electric flash method of welding. When Thermit welding is performed *in situ* possession of the track has, of course, to be obtained, which, according to the density of the traffic, increases the time and therefore the cost of carrying out the work. In the earlier installations already mentioned at Albany and Mechanicville, the rails were welded alongside the track, but often this method is less speedy and convenient than the method just described of welding the rails on the cars themselves.

Mr. Clarke stated in his paper that if the welds are properly made they give as good service as the unwelded part of the track, but in any case he did not feel particularly concerned about the safety of the welds because, even in the event of a fracture, the M. & L. type of fastening would prevent the rail from getting out of alignment. If breaks occur, either at joints or elsewhere due to rail defects, fresh plates will be applied temporarily

Thermit welding process in operation

Left: Electric flash weld. Right: Thermit pressure weld

and the breaks welded up later, a short section of rail being added for the closure welds. Transverse fissures, said Mr. Clarke, did not present any greater difficulty in continuous rail than in the present track construction, as by keeping the heat members together any heat can be removed without difficulty. The use of the Sperry detector car, coupled with the controlled cooling of the rails, has greatly minimised this danger.

The rails which are being welded are of molybdenum alloy, two types of which are being tried, each with 0·35-0·40 molybdenum and 0·04 maximum phosphorus, and one having 0·54-0·67 carbon, 1·20-1·50 manganese, and 0·10-0·15 silicon; the other has 0·67-0·80 carbon, 0·60-0·90 manganese, and 0·15-0·25 silicon. The physical requirements for molybdenum rail are the same as for other rail, although, in several cases, it was found necessary to modify the drop test to a 15-ft. drop. The rails are not heat treated, but those laid subsequently to 1934 have been subjected to controlled cooling.

There has been no perceptible movement of the long rails in the Delaware & Hudson installations, and indeed no indication of any movement has been detected between the clips and the rail throughout the entire stretch of the various installations; neither has there been any indication of movement in the joints at the ends of these stretches other than what would be normal in a 60 ft. rail.

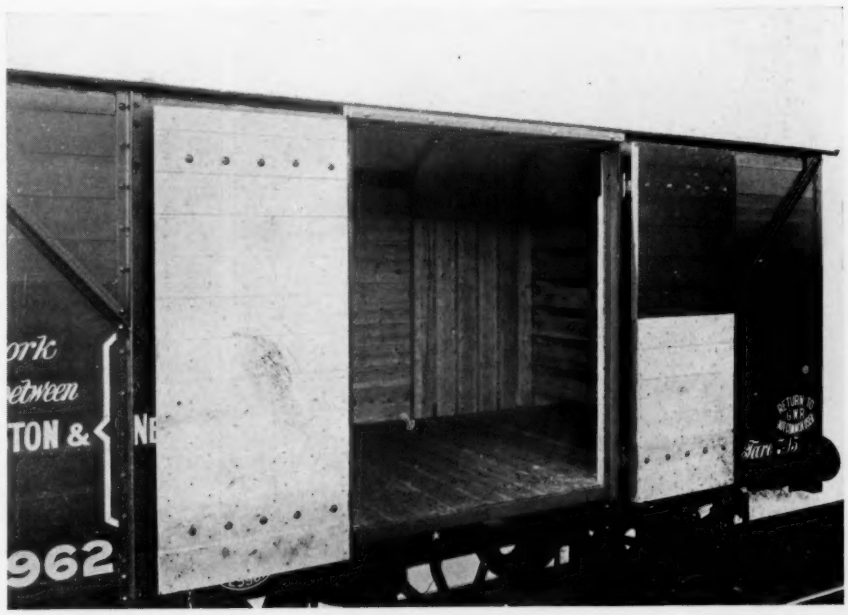
An account of the research work which is now being undertaken in connection with welding was given by Mr. Clarke at the conclusion of his paper. The various types of welds, he said, are being subjected to all the usual tests performed upon rail steel, including drop tests, tensile tests, bend tests, notch tests, and metallographic examinations. Perhaps the most important tests are those which are being made on a special machine which subjects the weld to a rolling wheel load, thus duplicating actual service conditions as closely as possible. With this machine years of service in the track can be duplicated in a few weeks. It is probable that the A.R.E.A. Committee on Stresses in Track, which has had the Delaware & Hudson installations under close observation, should be able to furnish some interesting data at the March convention of the A.R.E.A.

Two other railways in the U.S.A. are reported by the Metal and Thermit Corporation of New York to be installing experimental lengths of long welded rails. One is the Bessemer & Lake Erie, which uses the Geo type of rail fastening, now standard on the German State Railway, and the other the Southern, with ordinary double-shoulder soleplates.

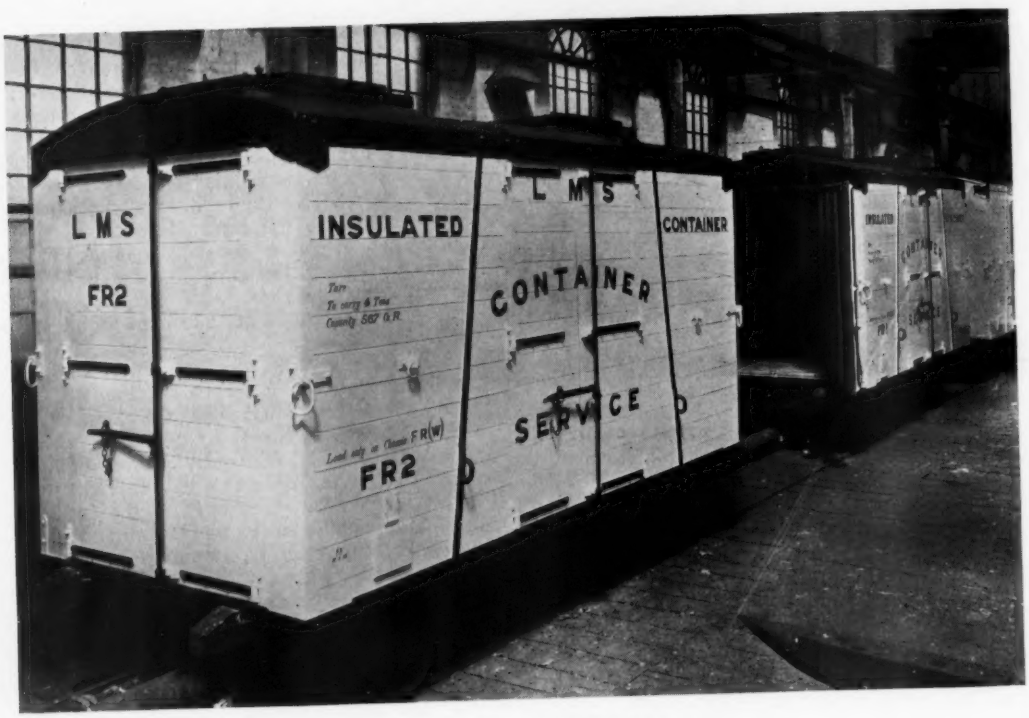
(*See editorial comment on page* 433)

Partitions in G.W.R. Covered Goods Vans

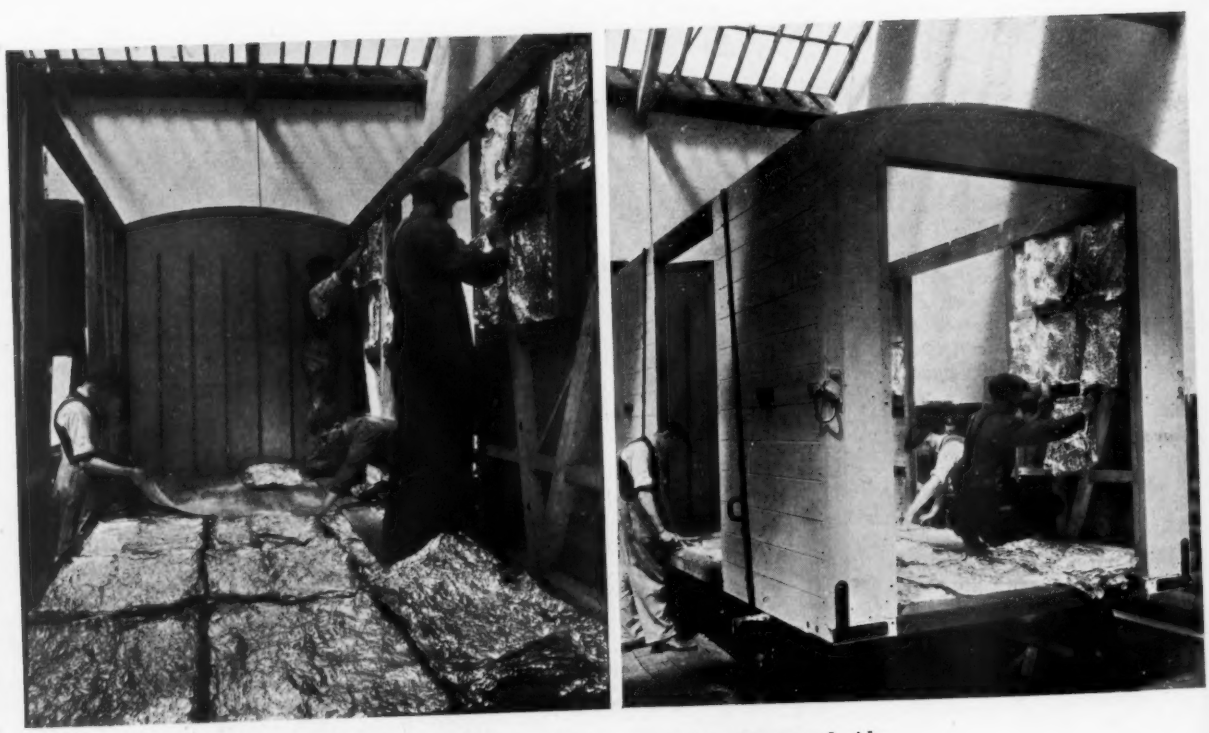
One of 15 *covered goods vans fitted experimentally by the G.W.R. with six-board movable partitions. These are arranged to fit into slots on each side of the door, so that the van can be divided roughly into thirds. The boards are stencilled with an instruction that they are not to be removed from the truck to which they belong. The vans themselves have been painted "Return loaded to . . immediately," with the name of the home station inserted. After exhaustive tests, it has been established that the support so given to easily damageable commodities both reduces shock and displacement of load, and also gives greater immunity from transit damage. The G.W.R. has now decided to equip* 100 *more vans in this way* (*see editorial note on page* 431)



Insulated Type Containers under construction at Earlestown Works, L.M.S.R.



Containers in the completed stage



Fixing the Alfol insulating material to floors and sides

THE DESIGN AND MANUFACTURE OF CONTAINERS

L.M.S.R. insulated type for the conveyance of fruit and meat

THE building of timber containers of the various types used by the L.M.S.R. is concentrated at the company's Earlestown works. Herewith we illustrate and describe examples of the insulated type, in which the roof carries two bunkers designed to contain solid carbon dioxide as a refrigerator. The assembly of the containers is carried out on the progressive system, the underframes, sides, ends and doors being put together in jigs located at convenient points in the layout; the sections are then placed in position as the container is moved on mobile trestles through the various stages of assembly.

The first operation is the assembly of the underframe, the main members of which are Australian Jarrah or Karri, and these timbers are also used for the principal body frame; the subsidiary members are deal. While robust construction is necessary, the design is such as to keep the tare weight as low as possible, hence the use of soft woods at points where strength is not the important feature. The underframe, sides and end members, manufactured to templates, are then placed in jigs, and held whilst suitable knees are bolted into position. The container, now a mere shell, is picked up by air hoists and placed on mobile trestles—having passed through four stages of operations, *viz.*: side assembly jig; fast end assembly jig; door end assembly jig; underframe assembly jig; the last named operation includes the fixing of the sides and ends.

The fifth operation is the fixing of the inter-floor insulation, which has already been prepared, and is secured with $\frac{3}{8}$-in. plywood boards which form the floor. By this time another shell is ready, and the first container is moved to the sixth operation, which consists of fixing the insulation in the sides and ends and screwing up $\frac{1}{4}$-in. plywood casing on the insides. The container is now moved to the seventh stage, where the roof linings are fixed. Upon these rests the roof insulating material, and at the eighth stage the outer roof boards, carbon dioxide bunkers, canvas, &c., are fitted. The container is then ready for the fixing of doors, which have been put together in jigs and finally fitted with spring leather seals. The fitting of the doors requires very great care to ensure that the container is air-tight. The interior of the container is next given two coats of shellac varnish, after which cold distribution plates made from aluminium are fitted to the undersides of the bunkers, and the moisture collected is run off through the drain pipe inside at each end of the body.

Galvanised meat hook rails are next bolted into position while the exterior of the container is being painted and lettered. This being the end of the progressive layout, the container is lifted from the mobile trestle and loaded on specially constructed steel chassis, when it is ready for traffic.

The Alfol system of insulation is used in these containers, with the exception of the solid carbon dioxide bunkers, which are insulated with Onozote. The gas given off by sublimation is led away to the atmosphere, thus ensuring that no leakage into the container occurs, where it might have a deleterious effect on the contents. These containers, as indicated above, are used for the carriage of fruit or meat. When used for fruit traffic, they are fitted with floor grids and trays, the latter nesting within each other in tiers, and leaving room for free air circulation.

When the containers are required for meat traffic, the floor grids and drip trays in the bunker are removed, and meat hooks attached to each of the steel bars which are permanently fixed in the roof. The solid carbon dioxide bunkers are used only for fruit traffic. For the conveyance of frozen meat, the containers are used as ordinary insulated stock. They are built to carry a load of 4 tons, with a capacity of 567 cu. ft.

A Railway Relic found in West Cornwall

What is claimed to be the oldest railway carriage in England has recently been discovered in the Scorrier neighbourhood by Mr. W. N. Blewett, of Cross Street, Camborne, a Cornish antiquarian. This vehicle is believed to have been the original carriage used by directors and officials on the mineral tramway between St. Day and Portreath, the first rail of which was laid by Lord de Dunstanville in 1809. The line was built to convey ore from the St. Day mines (near Scorrier) to the port, and served this purpose for about a century. The carriage is open, and is built of panelled yellow pine, with longitudinal seats for passengers to sit face to face; it is 6 ft. long by 4 ft. 6 in. wide. The cast-iron wheels, 20 in. in diameter, are not flanged, as the line was laid with the usual L type tram plates. Sections of the rails have been found and are being preserved with the vehicle.

Annual Dinner of the Institution of Locomotive Engineers

Two groups taken at the eighteenth annual dinner of the Institution of Locomotive Engineers, held at the Trocadero Restaurant, London, on Friday last, February 28

(*See news article on page 479*)

RAILWAY NEWS SECTION

PERSONAL

Mr. A. D. Jones, M.V.O., O.B.E., M.I.Mech.E., M.Inst.T., M.I.Loco.E., who, as announced in THE RAILWAY GAZETTE of February 28, retired from the position of Locomotive Running Superintendent of the Southern Railway at the end of February owing to ill health, was born in 1871 at Tilford near Farnham and educated at Haileybury College and the Engineering School at Owens College, Manchester. He became a pupil of Mr. Aspinall (now Sir John Aspinall) at the Horwich works, Lancashire and Yorkshire Railway, in 1889, and after having been in charge of locomotive running sheds, and the Outdoor Carriage and Wagon Department, and Assistant in the Running Department, was appointed Chief Assistant in charge of the Running Department in 1901. In 1912, Mr. Jones was appointed Outdoor Locomotive Carriage and Wagon Superintendent on the South Eastern & Chatham Railway (a new position), and he held that appointment until 1923, when he was given the position he is now resigning. Mr. Jones was made an Officer of the Order of the British Empire in 1918 and a Member of the Royal Victorian Order in 1929. He is also a Member of the Institution of Mechanical Engineers, Institute of Transport and Institution of Locomotive Engineers, having been President of the latter for 1917-18.

Mr. A. Cobb, who, as announced in our issue of February 28, has been appointed Locomotive Running Superintendent, Southern Railway, was educated at Shrewsbury School and entered the works at Ashford as a pupil in September, 1900, passing through the various shops and having six months' experience as a fireman. In April, 1905, he was appointed a Draughtsman, and, in December of the same year, Assistant Locomotive Inspector. In 1906 Mr. Cobb became Locomotive Inspector, which position he retained until his appointment in November, 1913, as Assistant to the Outdoor Locomotive Superintendent, his promotion to the position of Assistant Outdoor Locomotive Superintendent taking place in September, 1920. It was in December, 1923, that Mr. Cobb was appointed Assistant Locomotive Running Superintendent of the Southern group as a result of the amalgamation, the position from which he has now been promoted to Locomotive Running Superintendent with effect from March 1. He is a Member of the Institution of Locomotive Engineers.

RETIRED RAILWAY OFFICERS' SOCIETY

At a meeting of the society held at the Abercorn Rooms on February 18, the following officers were elected for the current year:—

Mr. George G. Senior, O.B.E., J.P., C.C., M.Inst.T., to be President.

Mr. J. Procter Smith, to be Hon. Treasurer.

Mr. W. A. Thomas, to be Hon. Secretary (re-elected).

Messrs. Dolden and Mortimore, to be Hon. Auditors (re-elected).

We regret to report the sudden death of Mr. J. Cruickshank, Deputy Chief Mechanical Engineer, Egyptian State Railways, which occurred on February 10. Mr. Cruickshank was much esteemed, and his loss will be a very real one to the department and to his many friends both in Cairo and Tanta.

Mr. A. H. Lingard, who, as announced in or last week's issue, is retiring from the position of Commercial Assistant to the Traffic Manager, Southern Railway, entered the service of the old London Chatham & Dover Railway in 1887 as a junior clerk in the Goods Manager's office. After obtaining a knowledge of the various sections in that department, he was appointed Assistant Rates Clerk in 1891. In 1900, on the working union of the London Chatham & Dover and South Eastern Railways, Mr. Lingard was responsible for the preparation of the complete list of goods rates between the two sections. He was appointed Chief Rates Clerk in April, 1911, which post he held until promoted to the position of Assistant to the Goods Manager in September, 1920. During 1923 he acted as Chairman of the Railway Clearing House meetings of Goods and Mineral Managers' Representatives in connection with the revision of rates and other questions affecting the Goods Department, and at the end of that year was appointed Assistant for Rates & Fares. In 1930 he was promoted to be Deputy Commercial Assistant, and in November, 1934, he was appointed Commercial Assistant to

Photo by [*Lafayette*

Mr. A. D. Jones, M.V.O., O.B.E.,
Locomotive Running Superintendent, Southern Railway, 1923-36

Mr. A. Cobb,
Appointed Locomotive Running Superintendent, Southern Railway

Mr. A. H. Lingard,
Commercial Assistant to the Traffic Manager, Southern Railway, 1934-36

Mr. W. M. Perts,
Appointed Commercial Assistant to the Traffic Manager, Southern Railway

Mr. A. E. Hammett,
Appointed Deputy Commercial Assistant to the Traffic Manager, Southern Railway

Elliott] [*C. Fry*

Mr. P. Nunn,
Appointed London (East) Divisional Superintendent, Southern Railway

Mr. C. F. de Pury,
Appointed Divisional Superintendent, Western Division, Southern Railway

Mr. W. A. Brown,
London District Freight Superintendent, Southern Railway, 1930–36

Mr. E. E. Young,
Appointed Divisional Superintendent, London District Freight Division, Southern Railway

Mr. W. M. Perts, who, as announced in THE RAILWAY GAZETTE of February 28, has been appointed Commercial Assistant to the Traffic Manager, Southern Railway, entered the service of the London Chatham & Dover Railway in 1891. In 1911 he was appointed Assistant to the Parcels Manager of the South Eastern & Chatham Railway, and was placed in charge of the work of the department in 1921. In the organisation of the Southern Railway in 1923, Mr. Perts was appointed Deputy Assistant for Rates and Charges to the Indoor Commercial Manager. In 1930 he became Assistant for Rates and Fares to the Traffic Manager, and in December, 1934, was promoted to be Deputy Commercial Assistant, the position he now relinquishes to become Commercial Assistant to the Traffic Manager. He is a foundation Member of the Institute of Transport.

Mr. A. E. Hammett, M.Inst.T., who, as recorded in our issue of February 28, has been appointed Deputy Commercial Assistant to the Traffic Manager, Southern Railway, began his railway career with the former London & South Western Railway at the Borough depot, London, in 1905. He was transferred to the Claims office of the Goods Manager's Department in 1913, was promoted to District Representative in 1917, and in July, 1919, was appointed Outdoor General Assistant. Two years later he was made Chief Cartage Assistant to the Outdoor Goods Manager, and early in 1930 was appointed Deputy Assistant for Road Transport to the Superintendent of Operation, Southern Railway. In 1931 he was promoted to be Assistant for Road Transport, and in December, 1934, became Assistant for Rates and Fares to the Traffic Manager, the position from which he is now promoted to be Deputy Commercial Assistant. He is a Member of the Council of the Institute of Transport.

Mr. P. Nunn, who, as announced in THE RAILWAY GAZETTE of February 28, has been appointed Divisional Superintendent, London (East) Division, Southern Railway, joined the London Brighton & South Coast Railway in 1900, and for ten years gained valuable experience in all branches of station working at several important suburban stations. He was then transferred first to the Parcel Manager's staff and later to the office of the Superintendent of the Line, in 1912. From then until 1923, except for a period during the war, he was engaged in passenger commercial work. He obtained first position at the Croydon Signalling School during both the 1914-15 and the 1920-21 sessions. In 1923, Mr. Nunn was appointed Assistant London (West) Divisional Commercial Manager, and in 1930 was promoted to be Assistant London (West) Divisional Superintendent. It was in May, 1934, that he was appointed Divisional Superintendent, Western Division, Exeter, the appointment he now vacates to go to London Bridge as London (East) Divisional Superintendent. He served in the Royal Garrison Artillery during the war.

Mr. C. F. de Pury, who, as reported in our issue of February 28, has been appointed Western Divisional Superintendent, Southern Railway, joined the London Brighton & South Coast Railway in 1912, and served in the Superintendent of the Line's office until August, 1914. In 1919 he was placed in charge of the Passenger Claims Section and at the time of the amalgamation was transferred to the Chief Operating Superintendent's office, being appointed Assistant for the Commercial and Operating Departments in the Isle of Wight in 1925. In May, 1930, he became Assistant to the London (West) Divisional Superintendent, and in July, 1933, was appointed Assistant Superintendent of that division, from which position he is now promoted to be Divisional Superintendent, Western Division, with headquarters at Exeter. During the war Mr. de Pury was mobilised with the Artists Rifles and served in France and Germany in the Royal Fusiliers and Railway Transport Establishment.

Mr. W. A. Brown, who, as recorded in THE RAILWAY GAZETTE of February 28, is retiring from the position of London District Freight Superintendent, Southern Railway, joined the service of the South Eastern Railway in 1897 at Bricklayers' Arms station, being appointed Station Superintendent at that depot in 1912. In 1917 he was attached to the Royal Engineers, being nominated by Sir Francis Dent, on behalf of the War Office, to take charge of a staff selected from the various railways to specialise on the economic use of railway wagons in France. In 1919 Mr. Brown was appointed Assistant to the London District Goods Superintendent, and in December, 1923, became Eastern Divisional Commercial Manager (Dover). It was in March, 1930, that he was appointed London District Freight Superintendent at London Bridge, the post from which he now retires.

Mr. E. E. Young, who, as recorded in THE RAILWAY GAZETTE of February 28, has been appointed Divisional Superintendent, London District Freight Division, Southern Railway, entered the service of the South Eastern & Chatham Railway as a clerk at the Goods office at Maidstone in April, 1900, and was transferred to Bricklayers Arms just eight years later. After serving in various capacities there, he was transferred to the office of the London District Goods Superintendent in 1911, and was appointed Staff Clerk to the Divisional Officer in 1915, and Chief Clerk two years afterwards. When the grouping came into force in 1923, Mr. Young was appointed Chief Clerk to the Outdoor Commercial Manager in November of that year, and remained there until the reorganisation on April 1, 1930. After being Chief Clerk to the London District Freight Superintendent for a short time, he was promoted to be Assistant Goods Agent at Bricklayers Arms on January 1, 1931. Whilst Mr. Young held this position the Bricklayers Arms and Willow Walk depots were amalgamated. It was on November 1, 1932, that he was appointed Goods Agent at Brighton, the post he relinquishes to take up his new duties as Divisional Superintendent, London District Freight Division on April 1.

Mr. G. B. F. Neele, Assistant General Manager of the Leopoldina Railway, left Rio de Janeiro on February 18 on leave to England.

Mr. E. J. Buckton, M.Inst.C.E., M.I.Mech.E.—a Partner in the firm of Messrs. Rendel, Palmer & Tritton, Consulting Engineers, Westminster—left London on February 27 for India and will be away for two months.

Mr. H. E. Mellor has announced his retirement, on March 31, from the position of Secretary and Accountant, Belfast & County Down Railway, after 25 years service as Secretary and the last five as Accountant in addition.

Mr. T. B. Andison has been appointed by the directors to fill the vacancy. He is a qualified chartered secretary, who has for 23 years been in the company's service, latterly as Mr. Mellor's chief assistant.

We regret to note the death on February 23 of Lt.-Col. H. J. Higgs, O.B.E., J.P., Managing Director of Ransome and Marles Bearing Company of Newark-on-Trent. After gaining a rowing "Blue" at Cambridge, he was in the Egyptian Irrigation Department before the war, and then served with distinction in the Royal Engineers eventually being promoted Lt.-Col. During bombing training near Newark he earned the Albert Medal in gold for conspicuous action in saving his men from a dropped bomb. Col. Higgs became Manager of the Newark firm in 1919, subsequently being elected Managing Director.

INDIAN RAILWAY STAFF CHANGES

Mr. R. L. W. Meehan has been appointed to officiate as Chief Mechanical Engineer, E.I.R., as from January 20, and Mr. R. G. Hughff has been appointed officiating Deputy Chief Mechanical Engineer in his place as from that date.

Mr. J. C. Gibson, Deputy Chief Mechanical Engineer (Running), E.I.R., has been appointed to officiate as Deputy Agent (Organisation) as from January 24.

Mr. A. G. E. Briggs, Special Director and Sales Manager, English Steel Corporation Limited, has been appointed a Director of the Darlington Forge Limited. Mr. Briggs served his apprenticeship at the Vickers works, and subsequently joined the sales staff at the London office of Vickers Limited. After the formation of the English Steel Corporation, he was for a short time with Ibbotson Bros. & Co. Ltd., and made a tour of the South American states on behalf of that company. He rejoined the Vickers group as Sales Manager of the English Steel Corporation three years ago, and was appointed a Special Director in February, 1935.

Mr. W. F. D. Allison, Chief Mechanical Engineer, Tanganyika Government Railways, has retired from the service. He was formerly Assistant Locomotive Superintendent, first on the Nigerian and then on the Kenya and Uganda Railway.

Mr. C. H. Newton, General Manager, Southern Area, L.N.E.R., has been appointed a Director of the East Midland Motor Services Limited and of the Trent Motor Traction Co. Ltd. in lieu of Mr. G. F. Thurston, who has retired from the directorates of these companies.

As a result of the death of Lt.-Col. H. J. Higgs, referred to above, the directors of Ransome & Marles Bearing Co. Ltd., decided on February 27, to appoint Mr. J. A. Ross, C.A., and Mr. C. G. H. Richardson, B.Sc., M.I.Mech.E., A.M.Inst.C.E., as General Managers of the company.

The Rt. Hon. Lord Hewart, P.C., the Lord Chief Justice of England, has accepted the invitation of Sir Robert Horne, G.B.E., K.C., M.P., Chairman of the Great Western Railway Company, and President this year of the Railway Benevolent Institution, to be the guest of honour at the anniversary festival dinner to be held on Tuesday, March 31, at the Connaught Rooms, London.

SOUTHERN RAILWAY COMPANY

Improved net receipts—First class journeys increase—Successful year at Southampton—New traffic created by electrification —Works with Government-aided loan—Train ferry plans

The annual general meeting of the Southern Railway Company was held at Southern House, Cannon Street station, E.C.4, on Thursday, February 27, Mr. Robert Holland-Martin, C.B. (Chairman of the company), presiding.

The Secretary (Mr. F. H. Willis) read the notice convening the meeting.

The Chairman said:—

My lords, ladies and gentlemen,—The shadow of a nation's grief still falls heavily upon us as we mourn the loss of a King whose every action in its wisdom and grace endeared him the more to his people.

King George V

Owing to the great progress made by science in his lifetime, and particularly during his reign, the people of his vast Empire, even to the ends of the earth, knew his voice and listened to his messages with pride and affection unknown to the world before. That Empire, which was in his thoughts up to the very last, was ever made more united by his wise actions and advice. He had visited much of it himself before coming to the Throne, and in this country he took the greatest interest in every development, as we on your line know well.

He is succeeded by a son who as Prince of Wales had been able to travel through the Empire and among the people of the world even more widely than his father. Wherever he has been he has gained the affections of men. He has shown that he is a true Englishman and we look forward to his reign with the knowledge that he will conduct himself as well as his father. Long may he reign! (Applause.)

Before I come to the business of our meeting, I should like to refer to the death of two men who by their wise counsel and assistance played a large part in the history of our line. I refer to Sir William Peat and Sir William Forbes.

Sir William Peat, who died on January 24, was for many years connected with the audit of the accounts of our constituent companies. He was, as you know, one of the greatest accountants of his day—a man skilled in business and in affairs, whose advice was sought far and wide, and given readily and fearlessly. He died full of years and honour, and we lost a real friend.

Our old friend Sir William Forbes passed away on February 14. His connection with our railway was most intimate, for he served with no less than three of its constituent railways. He joined the London, Chatham and Dover Railway in 1873 at a time when his uncle, James Staats Forbes, was its Managing Director. In 1888 he was appointed Continental Manager. In 1899, when the South Eastern joined up with the London, Chatham and Dover Railway, he was appointed Assistant General Manager, but in the autumn of that year he went to the London, Brighton and South Coast Railway as their General Manager, a post he held till the general amalgamation of 1923.

The Southern Railway shareholder of today is deeply indebted to Sir William Forbes, and his memory will remain revered by railway men as that of a great pioneer and administrator, who could always draw the best from his devoted colleagues. He will be mourned by all who knew him as a charming and loyal friend. To him we owe the reconstruction of Victoria station, many line widenings and improvements in our Continental services, but above all, his was the imaginative brain that first visualised the wide prospects of suburban electrification and its possible extension to the coast towns, a width of vision which has been followed and extended by our present General Manager, Sir Herbert Walker, to whom the Southern Railway owes so much of the outstanding success of the policy of electrification.

I assume you will take the report and accounts as read.

I now propose, as is the custom at these meetings, to go through the accounts very rapidly and to lay stress only on the more important items. Under the heading of "Nominal Capital Authorised and Created" you will find the addition of the £7,500,000 authorised by the Southern Railway Act of 1935. The capital expenditure for the year amounted to £1,361,000 and is composed as follows: Spent on electrification of lines, £622,000; on additions and improvement at various stations, including the new ferry terminal at Dover, £337,000; on Motspur Park and Leatherhead line—mostly purchase of land, £21,000; on steamboats, £94,000; on Southampton docks, £390,000; a total of £1,464,000. From this total of £1,464,000 there has to be subtracted £103,000, comprising £34,000 written off on accounts of disused and displaced capital works; and £69,000 sales of land and property; leaving the capital expenditure for the year £1,361,000.

Our further expenditure on capital is estimated to be £1,640,000 in 1936, and £5,200,000 in succeeding years, a total of £6,840,000. That the amount is so large is occasioned by the inclusion of that programme of work which we have undertaken to carry out in consequence of the agreement we entered into with the Treasury last year. No portion of the programme, I need scarcely assure you, was sanctioned till very careful scrutiny had made certain of its being work likely to be remunerative to the shareholders. Under the agreement nearly £6,000,000 will be advanced to us during the next four years at a low rate of interest against the collateral security of a special debenture stock.

Improvements in Net Receipts

Passing to the revenue account, it is gratifying to be able to report that there is an increase in our net receipts from railway and ancillary businesses of £287,000. To this amount the railway contributed £256,000; docks, harbours and wharves £39,000; and hotels £9,000. This last increase in the hotels is no doubt due to the improvements we have made in the Charing Cross Hotel. That hotel has long had its clientèle from the Midlands and the North, and it is now, I am glad to say, being patronised by many who live in our area and appreciate its unique position and comfort. On the other hand the net receipts from our steamboats decreased by £15,000, and our loss on air transport increased by £4,000.

Our passenger train receipts at £15,626,000 show an increase of £462,000 as compared with 1934, and of nearly £760,000 as compared with 1933. In 1933 we carried a total of 324,327,000 passengers; in 1934, 337,942,000; and in 1935 no less than 349,241,000.

Of the increase of £462,000, no less than £240,000 is attributable to traffic within our growing electrified area. £43,000 more than in 1934 was received from continental passenger traffic and the bookings between London and certain seaside stations outside the electrified area increased by £56,000. These heavier bookings were no doubt to some extent brought about by Jubilee Celebrations and the Naval Review.

More First Class Journeys

You will be interested to know that the number of first-class passenger journeys increased by over 1,000,000, that is to say, from 15,089,000 in 1934 to 16,130,000 in 1935. Of this increase about one half was in journeys made by season ticket holders and the remainder in journeys by ordinary passengers. This is the second year since 1928 in which we have had an increase in our ordinary first-class traffic,

and it is brought about partly by the generally returning prosperity of the country, but even more by the growing number of persons who, taking advantage of the new cheap ticket rates, gain the comfort of first-class travel by paying the 50 per cent. difference between first and third class that pertains to those cheap tickets.

Smaller Movements of Goods

Goods train receipts decreased by £185,000, though as compared with 1933 they show an increase of £30,000. The decrease of £185,000 is spread over all classes of traffic. It is due to a large extent, to the fact that many of the large building schemes throughout the London suburban area have been completed, and that there is a distinct falling off in new building developments. This slackening of building activity is also reflected in the considerable reduction in the amount of material used in making new roads. We can trace a diminution of over 200,000 tons in the quantities of house-building and road-making materials conveyed by our railway.

Then again, during the past 5 or 6 years our charges on the higher class of goods traffic have been subjected to a gradual abatement in order to prevent such traffic being diverted to Road Transport. These reduced charges, together with the fact that the traffic is on the average being conveyed for shorter distances than formerly, have brought about a reduction in our goods train traffic receipts from 6s. 4½d. per ton in 1929 to 5s. 8d. per ton in 1935.

I sometimes wonder whether the shareholders in the English main line railway companies realise how much their investments, and yours in particular, are affected by circumstances over which neither they nor the boards whom they elect to safeguard their interest have the ultimate control. It is sometimes difficult to reconcile national policy with the interests of your company, which is particularly sensitive to the problems of international trade. By the geographical position of our line we command all the short sea routes to the Continent, and our steamboats carry most of the traffic across the Channel. The earnings of your railway, your harbours and your steamboats from Continental traffic have always formed an important part of your revenue, and when that traffic suffers, your revenue suffers too.

International traffic—both passenger and merchandise—continues to suffer severely from the difficulties of the international situation. Depreciated sterling restricts the flow of tourists out of this country without adequate compensation in the inwards direction. The flow of merchandise continues to be obstructed by Customs tariffs, quotas and other restrictions, while Italian traffic is, of course, affected by the present situation.

Patronage of Dover-Ostend Route

The tourist traffic by the Dover-Ostend route, as an exception, has shown considerable recovery, no doubt attributable in part to the devaluation of the Belga, the attractions of the Brussels Exhibition, and the advantage to travellers of the use of the Registered Mark in Germany. It must, however, be remembered that this traffic, so far as it consists in diversions from our other routes, results in diminished steamboat earnings. If you examine our net steamboat receipts in 1935 compared with 1928, you will find that last year we had a net earning of £107,000, while in 1928 the comparative figure was £477,000, so that from this source alone our revenue has undergone a reduction of £370,000, owing to circumstances over which we, as a company, had absolutely no control. The earnings on your railway itself from the conveyance of Continental traffic have suffered even more severely, and I do not think that I am overstating the case if I say that were 1928 conditions with regard to traffic restored, your company would be earning not less than £1,000,000. The air, too, which is heavily subsidised in this country as in almost all others, has taken away from us a considerable portion of our first class Continental traffic.

Railway expenditure increased by £273,000. Of this £100,000 is due to the restoration of the percentage cuts in salaries and wages to which I referred in my speech last year. The remainder can be attributed to the normal costs of an increased passenger traffic, to the larger expenditure due to the much greater mileage run under electrification, and to the fact that owing to the unusually heavy winter rainfall, we had to spend £55,000 more in making good the damage caused by slips, notably at Winchfield on the main line to Salisbury, and at Botley on the Eastleigh-Portsmouth line.

You will notice that under the two headings of "Rates" and "Freight Rebates Fund" there is a decrease of £246,000. The amount actually paid under these headings increased by £4,000, due to increased poundages in certain Parishes, but we have taken credit for a sum of £250,000 on account of estimated overpayments for the year. About this I shall have something to say later on.

Under the heading "Steamboats" we show a reduction, as already stated, of £15,000 in our net receipts, due to a transference of passengers from the French to the Belgian route, due partly to the attraction of the more favourable rate of exchange in the latter country, and also to the Brussels Exhibition. As you are aware, the services from Dover, Folkestone, Dieppe and Southampton to France are operated by vessels owned wholly or in part by this company, whereas the service from Dover and Folkestone to Ostend belongs to the Belgian Government, and the receipts by these boats fall to them.

Good Results at Southampton

Southampton docks, which some of our critics in the past have spoken of as a sort of bottomless pit of unconsidered and unremunerative expenditure, gave us an increase in net receipts of £34,000. There has been a very remarkable increase under all heads, that is to say, in the number of ships arriving and departing, 6,222 compared with 5,676 in 1934, an increase of 9·6 per cent.; in gross tonnage of shipping, 36,025,927 tons against 33,348,239 tons for 1934; an increase of 8 per cent.; in cargo inwards and outwards, 648,443 tons were imported and 399,560 tons exported in 1935 against 569,621 tons and 359,391 tons respectively for 1934, an increase of 12·8 per cent.; and in the number of passengers both inwards and outwards, 537,355 compared with 484,074 in 1934, an increase of 11 per cent.

The constructional work in connection with the new docks at Southampton is gradually coming to an end. The new King George V graving dock, built to accommodate the *Queen Mary* will, we hope, be occupied by her next month for dry-docking. The first stage of the new docks extension will be finished in about six months' time and by the end of this year we should see the completion of No. 2 stage, with the exception of certain road making, drainage and reclamation. On the estate of 400 acres reclaimed by us from tidal mud flats, 131 acres are reserved for industrial purposes, and already inquiries for factory and warehouse sites are being received. It should not be long before we begin to get a handsome return from a site so well equipped with access by road, rail and sea, and with electric power available in a growing city that has increased its population from 65,621 in 1892, when the L. & S.W.R. took over the docks, to 120,512 when the ocean dock was opened in 1912, and to some 177,000 in 1934.

The increase in net revenue in the first year in which the 7,000-ft. quay of the new docks extension has been available for dealing with shipping traffic is very encouraging, and I am certain that should the present revival of trade continue, the docks will earn even better returns in the future.

Up to the end of last year the amount spent in connection with the docks extension, including the new graving dock, had been £6,600,000, and you will like to know what sort of a return we have had on that expenditure. It is, of course, very difficult to allocate receipts and expenditure to any one section of our dock property at Southampton, but I can tell you this, that at the date of amalgamation the old South Western Company had spent a sum of £5,128,000 at Southampton, on which they received a return of 2·95 per cent., and that last year, when the expenditure at Southampton had mounted to £11,732,000, we received, including the interest grant from the Treasury, a total of £430,000, or 3·66 per cent. on the total expenditure. This year the grant from the Treasury will be on a reduced scale,

but we hope to make up that loss by additional trade. The returns for January, 1936, show an increase of £12,000 net.

Our share of the loss in the partnership that we have with the L.M.S.R. in the Somerset and Dorset line was less by £8,000—£49,432 to £41,383. The revenue from rents increased by £12,000. Dividends received from our investments in Carter Paterson and Pickfords increased by £2,000. Dividends from our investments in our associated omnibus companies increased by £12,000, but the other items of interest fell by a net sum of £50,000, mainly as a result of our having sold securities in order to meet capital expenditure, so that the heading " General Interest " shows a reduction of £38,000.

The interest grants received from H.M. Government in connection with the work at Southampton increased from £112,000 to £121,000. This payment to us is now at its peak and will henceforth decrease each year. The interest we had to pay on superannuation and other funds advanced by £7,800. Taking all these different items into account, there was an improvement in our net revenue for the year of £272,000.

Full Preferred Ordinary Dividend

After allowing for the interest on our annuities and debenture stocks and the dividends on our guaranteed and preference stocks, there remains a sum of £1,605,000 available for dividend on the ordinary stock as compared with £1,331,000 for 1934. This permits of our paying the full dividend of 5 per cent. for the year on the preferred ordinary stock as compared with 4 per cent. paid for 1934, so that we are left with a carry forward reduced by some £1,500 to £225,875. The additional cost of this 1 per cent. extra dividend is £275,866.

I will now return to the subject of rating with which I dealt very fully at our meeting last year. As we then anticipated, the Railway Assessment Authority and the local authorities appealed to the House of Lords against the decision of the court of the Railway and Canal Commission. It will be remembered that the Railway Assessment Authority had fixed our net annual value at £2,180,000 and that the Court reduced this to £1,077,131. The net annual value which has been in force since April, 1931, is about £1,840,000, so that the company's valuation was reduced by the court to the extent of about £750,000. The case came on for hearing in November last, and on January 24 the House of Lords gave its decision dismissing both appeals. The Court held that the Railway and Canal Commissioners had made their valuation on the right principle, but left it open to the appellants to apply to the Railway and Canal Commissioners to review their valuation of £1,077,131 in the light of their ruling on a number of subsidiary points. The appellants are in fact taking that course, so that the matter is to some extent still *sub judice*.

Estimated Savings on Rating

In the meantime we have given careful consideration to the position; we are advised that we may legitimately proceed to the assumption that our payments and contributions under the headings of " Rates " and " Railway Freight Rebates Fund " for 1935 have been on too high a basis; we have accordingly taken credit in the year's accounts for the sum of £250,000 under those headings. As I explained last year, under the provisions of the Local Government Act, 1929, 75 per cent. of our rate liability has to be paid into a fund called the " Railway Freight Rebates Fund " and the remaining 25 per cent. to the local authorities. The loss of rates suffered by the local authorities as a result of de-rating has been made good to them by grants from the National Exchequer. The 75 per cent. paid into the Freight Rebates Fund is distributed to traders in the shape of rebates on railway charges for certain selected classes of traffic. There is no question of recovering from the traders on account of the House of Lords judgment any of the sums allowed them as rebates, but any overpayments into the freight rebates fund during the past five years must in due course be repaid to us out of that fund.

Last year I told you that should the case go in our favour, it would mean an annual saving of some £300,000 and in our accounts, as I have said, we have taken credit for £250,000. I should like to take this opportunity of again thanking our learned counsel for their conduct of this important case, and our solicitor, rating agent, and all from our staff and elsewhere whose hard work contributed to this epoch making victory.

Some of our deferred stockholders, who, alas, have long gone without any dividend, and with whom the board has the greatest sympathy, have said, " why have you not written back the whole £300,000 and added to that some of the carry forward and given us a dividend?" I fully sympathise, but I would remind them that we have ventured to take credit in the year's accounts for £250,000 though we have not yet received one penny of it, that the amount we carried forward last year is none too large for such a company as ours in relation to the size of our capital, and thirdly—and to my mind this is the most important of all—that we, whom you have entrusted with the carrying on of this great undertaking, wish, after these years of national and world-wide depression, that that undertaking should move in one direction only—forward—convinced that it is in the true interest of all the shareholders that when a dividend on the deferred stock begins to be paid, it should not be a flash in the pan, but should have a reasonable prospect of being continued and, if possible, increased. I would therefore ask the deferred shareholders to exercise their patience a little longer and to be content this year with knowledge that a good foundation has been laid for the future.

I can assure them that the board and the management take the utmost care when working out the value of any proposed scheme for electrification or for improved facilities to make certain that the return upon the money spent will not only pay the interest on any new capital expended, but will result in an overplus that can be applied towards paying a dividend on the deferred stock, the holders of which, or their predecessors, helped to find the money in hard cash to provide for the machinery of the line and the running of it. Had the money not been forthcoming, the labour we employ today would have had to find employment elsewhere, and so too would the many thousands of workers in coal, iron, electric and other industries who now benefit from our being alive and expanding.

Capital Expenditure Justified

It is sometimes alleged that railway stocks represent not only the money put up, but a great deal of water. It is glibly said, but what does it mean? The crudest instances are said to have occurred on the construction of a line where more stock may have been given than pounds subscribed, or payment made to a landowner who extorted a price in excess of the value of his land—and we all know that when railways were made some excessive prices were given. But let us look at our line today. Could it, with its appurtenances of docks, steamers, and hotels, be made and equipped for anything like the same money? What of the moneys that year by year, instead of being paid away to shareholders have gone to write down values, to replace obsolete and obsolescing material and in improvements to add to its efficiency? Though the world today is faced with many political, national and economic problems, I venture to think that our deferred stockholders, though their hearts must in many cases be sick with hope deferred, must have some cause for consolation. In every penny we spend, we have them in mind. I find that the average return on the £23,000,000 which your company has spent on electrification, on docks extensions, and on investment in road transport undertakings is not less than $8\frac{3}{4}$ per cent., and when you consider that in 1935 your company, after meeting all its prior charges earned 2·33 per cent. on the whole of its ordinary capital, I think that there is room for congratulation.

I tell you that there is far more than £167,400,000 of true capital in your railway, and the constant care and objective of your directors and management is to make that capital earn its proper return for those who are its share-

holders. And seeing what trade and business throughout the world have been during these past few years, I do not think the record of the Southern Railway is a bad one, for it is paying the full dividend on all but 31½ millions, that is to say, on nearly 82 per cent. of its total capital.

Do you, its shareholders, realise that your company, so far as I can find, holds the proud position today of being one of the only three railways in the world that have earned and paid a dividend on their ordinary stock. One of these is an American, another an Indian, railway.

The railways in this country have all had to stand on their own, compelled to witness the rise of a road competition that Parliament refused for years to allow them to compete with on equitable terms, and have had to suffer for the breakdown in international exchange that I referred to before which has crippled the trade of the whole world.

Restoration of Cuts

In my speech last year I dealt rather fully with the discussion which the railway companies had had with the railway trades unions with regard to the reduction which had taken place in salaries and wages of railway employees as a result of a decision of the National Wages Board in January, 1931. I then told you that, following these discussions, the companies and the unions agreed in August, 1934, to a restoration of the second part of the percentage deductions, that is to say, the 2½ per cent. deducted on earnings in excess of 40s. a week. This concession, part of which operated from October 1, 1934, and the other part from January 1, 1935, cost us in 1935 no less than £112,000. Recently the unions have made further application for a cancellation of the whole of the deductions, and a reversion to the payments for overtime, Sunday and night duty, which were in force prior to the decision of the National Wages Board in 1931.

To grant all that the unions are asking would cost the four railway companies about £3,500,000 per annum. Negotiations are proceeding, and, if we fail to reach agreement, the matter will, in due course, be dealt with under the new machinery set up in accordance with the scheme I outlined in my speech last year.

Success of Electric Traction

The electrification of our line is proceeding satisfactorily, and according to plan. In July last we extended electric traction to Lewes, Seaford, Eastbourne and Hastings, and in October we re-opened the line between Elmers End and Sanderstead in the Croydon area and established electric services. At the same time we electrified the section of our line between Lewisham and Nunhead, and this enabled us to run a through service of trains from certain stations in the suburban area to St. Paul's. This was done with the object of easing the overcrowding that takes place during the rush hours on the trains into Cannon Street and Charing Cross.

You will be interested to hear the satisfactory financial result of some of our latest electrification schemes. When the estimates were prepared in 1932 for the electrification of the line to Sevenoaks via Orpington and via Swanley, it was estimated that an increase of 27·1 per cent. on the then revenue of the area would be sufficient to pay the increased cost of working, including the interest on the amount charged to capital. Last year was the first year operated under electric traction and the number of passengers increased by 55 per cent. and the revenue by 41 per cent., as compared with 1932.

On the Eastbourne and Hastings section of electrification it was estimated that an increase of 1·25 per cent. in the receipts would have met the cost of electrification. As a matter of fact the number of passengers increased in the first six months—*i.e.*, from July to December last—by 22 per cent. and the revenue by 16 per cent.

In view of these satisfactory figures it will not surprise you that we have decided to go ahead with the electrification of other portions of our line, and this brings me back to the loan under Government guarantee to which I have already referred.

In December last the Government passed an Act authorising the Treasury to guarantee repayment of principal and interest of securities to be issued by a finance company formed in accordance with the Act, the purpose being to enable money required by the four railway companies to be raised by the finance company and advanced to them at a lower rate of interest than the railway companies could themselves obtain if they went into the market, in order to encourage them to proceed with the works of a major character which, but for such assistance, could not have been carried out in the immediate future. The Government requested the four railway companies to prepare a schedule of works they would be prepared to carry out within the next 5 years providing financial assistance were forthcoming in the manner indicated. Your directors had no hesitation in accepting the offer of the Government and accordingly undertook to carry out a number of works.

The amount the Southern Railway is to receive by way of loan, carrying interest at the rate of 2½ per cent. is approximately six million pounds, and the works we have undertaken to carry out are the following: the construction of the first part of a new line from Motspur Park to Leatherhead; the electrification of the railway to Portsmouth, both via Guildford and via Horsham; the electrification of the line from Swanley Junction to Chatham and Gillingham, and from Gravesend to Maidstone via Strood; the electrification of the line from Sevenoaks to Hastings; and the improvement of certain of our stations, such as Templecombe, Twickenham and others.

We feel confident that with the low rate of interest obtaining under the loan these works will become self-supporting and will undoubtedly result in an increase in the net revenue of our undertaking.

We have already taken in hand the electrification of the line to Portsmouth via Guildford, and hope to have electric services in operation by the summer of 1937. The only liabilities we incur apart from the obligation of meeting the cost of interest on the loan and certain very small charges for management, is the issue by way of collateral security of an amount of £6,000,000 4 per cent. debenture stock, authority for which is being asked in the company's bill now before Parliament. There is no question of any public issue of stock in the near future.

Prospects for the Train Ferry

I told you last year of the structural difficulties we were having with our train ferry dock at Dover. These were happily overcome in the past year, but the overcoming of the difficulties added largely to the expense of the dock and its equipment and caused delay in its completion. We had hoped to have the ferry running early this summer, but we have had to postpone its opening till some date early in October next.

I am glad to tell you that the arrangements we have been able to make to secure freight from Spain, the South of France, Italy—when the clouds of war are spent—and Southern Central Europe are promising, and I hope that when the ferry comes into being it will add considerably to our traffic by reason of its convenience and rapidity of conveyance without breaking bulk.

Prospects for 1936

I have now given you an account of our stewardship in the past year, and you will like to know what is the outlook for the future. I am not a prophet, so cannot prophesy. I can only give you the various signs and portents which seem to forecast the future. The year, as I told you, has opened well at Southampton docks. We have space and storage room to house the fruit and produce that is coming to us in increasing amounts from all over the world and in particular from Australia, South Africa and Palestine. Passenger cruises still create a public demand. Unfortunately Italy's war effort in Abyssinia has caused her ports, for the time being at any rate, to be no welcoming ports of call for our cruising ships. This has and will turn many cruises eastwards, nor do tariff restrictions and quotas help us, nor the unbalanced budgets of many countries, nor too, does talk of war. If only the political horizon could be freed

from these clouds and the energies of nations directed once more to trade and commerce, then I feel certain that we should reap our reward. Business is certainly more active in this country in many directions, though, as I have said, one great industry, building, seems to be definitely slowing down. Exports have increased and we shall, I hope, receive our fair share of them.

Greater trade means greater travel, and as our lines become electrified we shall, I fully expect, find that our Portsmouth electrification will bring us a largely increased number of passengers from the development that must occur round that city and along the South coast. Competition with the air routes for passengers going to the Continent has increased and must inevitably do so, but we hope early next October to be able to start our train ferries running from Dover to Dunkerque, and I fancy that many business men and others will prefer to leave London late at night, sleep in a comfortable train berth undisturbed save by exceptional storms, till they reach Paris for breakfast, and to make a similar return journey after a dinner and theatre in Paris, to an early morning, or even a night dash by air.

I look forward, therefore, unless international storms arise, to meeting you next year with as good or, I hope, an even better account to put before you, and I say this because I know the devoted work and energy that our whole team of officers and men put into their work daily in order that the Southern Railway may maintain its place in the forefront of railway progress.

The Chairman then formally moved the adoption of the report and accounts.

Shareholders' Remarks

Mr. Leslie Boyce, M.P., believed that every stockholder would be wholeheartedly behind the board in its policy of pressing forward with electrification extensions wherever the necessary density of population either existed or could be cultivated. He submitted that the company should itself take the initiative in inviting the housing authorities and all responsible promoters of housing schemes within a certain radius of the system to explore the possibilities of further housing development and to discuss the question of railway facilities in those new areas. The stockholders had every reason, from the striking results already achieved, to look forward with confidence to a substantial increase in net revenue as the result of the £5,000,000 programme of electrification extensions to be undertaken under the Government scheme. He would like an assurance that the new works would be completed within the next three, or four, or five years. He hoped that suitable arrangements would be made with the Cunard and White Star Company to enable pilgrimages to be made from all over the system to see the *Queen Mary* whenever that vessel was at Southampton Docks.

Mr. James Mills asked whether it was intended to give an increased wage before an increase in dividend. He also inquired what the company was doing to combat air competition, and whether it could inaugurate an air service across the Channel.

Lt.-Commander A. F. Inglefield thanked the Chairman, on behalf of the British Railway Stockholders' Union, for the courtesy and facilities afforded during the past year when the union approached the board in the interests of the stockholders. He congratulated the board on its enterprise in providing Bournemouth with a weekday Pullman train. He submitted that a slight reduction in the carry-forward would have enabled a small dividend to be paid on the deferred ordinary stock leaving a carry-forward which would still have left a large carry-forward compared with that of the other railways, of nearly £70,000.

Mr. Gray referred to the large increase in the renewals under the head of steamboats. It was £32,866 in 1934 and £351,801 in 1935, a difference of £329,000, which was more than sufficient to pay 1 per cent. on the deferred stock. He would like to see in the accounts some reference to the revenue from rentals or payments by the Frederick Hotels Company in respect of restaurant cars. He also called attention to the increasing danger of breakdowns with the increasing electrification. The other day there was a serious breakdown in foggy weather, which caused the complete upset of the whole district.

Mr. Williams spoke on poster advertising. He wanted to see on the posters not what was in the mind of the artist responsible for them, but what the average man in the street could understand, and many of the posters were by no means clear. A great deal more should be said about the "Sunshine Line," and the posters should be as clear as possible. In one of the Hastings posters, for instance, there was a jumble, a mixed grill, of what went on at Hastings. If they wanted to advertise Hastings and their railway to it, they should do it so that anybody walking by could see exactly what they wanted to do. Again, instead of letting spaces on their bridges to motor car firms, who were really competitors and spoiled the countryside with their crude advertisements, the company should take the opportunity of showing everyone who went under those bridges that it owned the line leading to the sunshine in the South.

Mr. Wiltshire called attention to the difficulty he had encountered in obtaining a quotation for a season ticket between Brighton and Waterloo, and asked that there should be more Victoria-Brighton fast trains stopping at Clapham Junction.

Miss Josephine Starling suggested that the company should be stricter in choosing the type of men for service on the railway.

Mr. Plant asked that there should be a fuller use and advertisement of through bookings.

Chairman's Reply

The Chairman: My Lords, ladies and gentlemen, my board and myself are very grateful to Mr. Leslie Boyce and those who really feel that we have put up a somewhat good show to you this year, and we thank you very much for the kind remarks you have made. We thank you, too, for the true interest you gentlemen and ladies who have spoken take in our line. It is an opportunity for us to hear some criticisms which, perhaps, we should not otherwise hear.

I can assure Mr. Leslie Boyce that we have our eye on several estates and we have been giving facilities for new stations in new areas and have told people that we are only too ready to open stations if we can see that they have the funds and are going to put in a rapid and speedy development. I can assure him, too, that as regards the electrification we are going ahead with that as fast as ever we possibly can, not only for the reason that that is our pledge to the Government, to put the work in hand at once, but because we believe that the sooner we can get it through and completed the sooner will it be an earning proposition for you all.

Then as regards the *Queen Mary* at Southampton, we sincerely hope to find a very large number of people taking the opportunity of the special trips which will doubtless be run down there. At the moment we have been unable to make any programme ahead, because, as you know, she has not yet arrived. By the time she gets to her owners we shall doubtless have a very good programme for all those who wish to see her down at Southampton.

Then Mr. Mills asked whether we intend to give an increased wage before dividend. I have told you that negotiations are proceeding at the moment on the question with the Trade Unions, and it will be quite impossible, naturally, at this meeting to make any statement or to pledge ourselves in any way one way or the other, or we should imperil any negotiations that are being entered into.

As regards the air, I would like Mr. Mills to remember that in every nation every air line is very heavily subsidised, and that the railways are not likely to put up any very great effort at the moment for internal flying. As you know, they have railway air services which are keeping a watching eye on developments. We are engaged in external air services to the Channel Islands and the Isle of Wight, and I think it would be very much wiser for the railways not to start in with Continental developments of their own but to wait for the present and see what happens.

Then I can assure Commander Inglefield that it is not

the opinion of the board that our carry-forward is too large but we think that a company of this size, with its responsibilities, must have a good substantial carry-forward. We have great and true sympathy with the deferred shareholder, and we hope one day he will come here and thank us.

Mr. Gray drew attention to an increase, as he said, in steamboat renewals. Now that is not quite the real aspect of the accounts. If you look into the accounts, you will find that there is an offset by transfer to and from renewal funds. That shows a credit of £232,000 in 1935 as against a debit of £90,000 in 1934. As regards the restaurant cars, we let them out and the returns come under "rent." We do not do our own catering. As regards the danger of increasing breakdowns with electrification, so far we have only had two bad breakdowns. We are going into the matter very carefully, particularly about the one that occurred the other day, and we hope to find some means or other that will obviate so entire a black-out as happened then.

Then Mr. Williams referred to the posters. I have a great sympathy with him myself. I rather like the older style of poster, which is clear and clean cut and you see exactly what it does mean. I myself think that some of our "mixed grill" posters, as he calls them, are a little vague, but these extraordinary "mixed grills" seem to have a wonderful drawing power for the bright young things of today—so you cannot please everybody.

I assure Mr. Wilshire that we shall look into his complaints. If he had asked not at the booking office where the season ticket he requires is not on the schedule but elsewhere, he could certainly have had one on application. We will look into his other problems.

Miss Starling asked that we should exercise great care in taking on our employees. Well, we always do and we have a very fine body of men as you know, and we are very proud of them and I know they are very proud of the line. I can assure Mr. Plant that we will look into his question of through bookings. He raised the point last year.

I put the motion that I have read before to the meeting.

(The resolution was put and carried unanimously.)

The Chairman: The next business is the declaration of dividends. I will ask the Secretary to read the resolution.

The Secretary. "That the following dividends be and the same are hereby declared:—For the half-year to December 31, 1935, 2½ per cent. on the 5 per cent. guaranteed preference stock; 2½ per cent. on the 5 per cent. redeemable guaranteed preference stock (1957); 2½ per cent. on the 5 per cent. preference stock; 2½ per cent. on the 5 per cent. redeemable preference stock (1964); (making in each case with the interim dividends, 5 per cent. for the whole year) 4 per cent. on the preferred ordinary stock; (making, with the interim dividend of 1 per cent., 5 per cent. for the whole year). And that such dividends be payable (subject to income tax) on March 3, 1936."

The Chairman: I move that resolution.

Mr. Eric Gore-Browne (Deputy-Chairman) seconded, and the resolution was put and carried unanimously.

The Chairman: The next business relates to the retiring directors. There are five directors who retire at this meeting, namely, Mr. Gore-Browne, Mr. Corry, Sir George Courthope, Lord Radnor, and Mr. Sheath. No notice of opposition has been received, and I therefore beg to move: "That the following directors, who retire by rotation at this meeting, namely, Mr. Eric Gore-Browne, Mr. Herbert W. Corry, Sir George L. Courthope, Bart., M.P., The Right Hon. the Earl of Radnor, and Mr. Charles Sheath, be and they are hereby elected directors of the company."

Lord Rockley seconded, and the resolution was put and carried unanimously.

The Chairman: The next business relates to the retiring Auditor. Sir Albert Wyon retires and offers himself for re-election. As you know, a resolution must be proposed from the other side of the table.

Mr. Edwards moved: "That Sir Albert William Wyon, K.B.E., F.C.A., be and he is hereby elected an Auditor of the company." His experience in accountancy, his eminence in his profession, and his faithful services to this company—because he has been an auditor since it was formed as the Southern Railway, and I believe was auditor to one of the constituent companies—are a better recommendation than anything I can say, and, therefore, I commend his re-election to you.

Mr. Fellowes seconded and the resolution was put and carried unanimously.

Special Business

The Chairman: We now have the Special Business before the meeting. You will remember that last year you approved the company's Bill containing powers to raise additional capital amounting to £7,500,000, and following our usual practice I take the first opportunity after our Bill has received the Royal Assent to obtain your authority for the exercise of the powers, although there is no intention of issuing the capital during the present year. I now propose to submit a resolution to that effect, which I will ask the Secretary to read.

The Secretary: "(*a*) That under the powers conferred upon the company by the Southern Railway Act, 1935, this meeting consents to the raising for the purposes of the company's undertakings of additional moneys not exceeding in the aggregate £7,500,000 (after taking into account any premiums or discounts obtained or allowed as the case may be on the issue of any stocks) wholly or partially by one or more of the following modes as the directors may determine, that is to say:—(*a*) by the creation and issue of new ordinary stock; (*b*) by the creation and issue of new preference stock (including new guaranteed preference stock; (*c*) by the borrowing on mortgage of the company's undertaking; (*d*) by the creation and issue of debenture stock charged on the company's undertaking. (*b*) That any new stock so issued (other than debenture stock) be of such class, description, with such privileges, and bear such fixed, fluctuating, contingent, preferential, perpetual, terminable, deferred or other dividend or interest, and be allotted or disposed of at such times to such persons, on such terms and in such manner as the directors may think advantageous to the company; and that it shall not be necessary to offer such new stock or any part thereof to the holders of ordinary stock of the company in accordance with section 17 of the Companies Clauses Act, 1863; and that if the directors decide to create and issue the whole or any part of such new stock as preference stock (including guaranteed preference stock) the same may, if so determined by them, form part of and rank *pari passu* with any of the preference stocks (including guaranteed preference stocks) in the capital of the company. (*c*) That any debenture stock created and issued under the authority contained in paragraph (*a*) of this resolution may be issued at such price and bearing such interest and on such terms as the directors shall determine. (*d*) That any such new preference stock (including guaranteed preference stock) or debenture stock may be created and issued, if the directors so determine, subject to a right or power to call in, cancel, or redeem the same at such time or times, on such terms and in such manner as the directors may decide."

The Chairman: I beg to move that resolution.

Mr. Eric Gore-Browne seconded and the resolution was put and carried unanimously.

Special General (Wharncliffe) Meeting

Mr. Holland-Martin presided at this meeting, which was held to consider the company's Bill in Parliament, and the Bill promoted by the London Passenger Transport Board.

The Chairman: With regard to the Bill promoted by the company, the principal objects of this Bill, as explained in the circular which has been sent to each proprietor, are: (1) to obtain powers to close a level crossing and to construct new roads at Havant, these powers being required in connection with the electrification to Portsmouth; (2) to construct a quay and slipway at Lymington Pier Station and bridge widenings at Dover and Templecombe; (3) to empower the company and the London Midland & Scottish Railway Company (as owners of the Somerset and Dorset Railway) to undertake an improvement at Cornhill Bridge, Highbridge;

(4) the Bill will also enable the company—and this perhaps is the most important part of the Bill—to take advantage of the agreement between the Treasury and the four main line railway companies, which I have already mentioned, by which the carrying out of necessary railway improvements is to be expedited with moneys raised under Government guarantee. It will empower the company to borrow money not exceeding £6,000,000 from the Finance Corporation (which has now been formed by the Treasury) against a charge on the company's property secured by a 4 per cent. debenture stock. This stock will be issued to the Finance Corporation only, and will ultimately be returned to the company on the repayment of the loan. The repayment will be provided out of the company's capital powers. The rate of interest we are to pay to the Finance Corporation on the money we borrow from them is approximately 2¾ per cent. That briefly summarises the objects of the Bill.

As regards the Bill promoted by the London Passenger Transport Board: by clause 30 of this Bill powers are sought to enable the London Passenger Transport Board and the company and other amalgamated railway companies to enter into agreements for the construction of works and the provision of facilities in which the contracting parties are interested. The Transport Board and the main line companies now have, as you will appreciate, many interests in common.

The Chairman then moved the following resolution: "That this meeting having considered the Bills intended to be presented to Parliament, intituled, 'A Bill to empower the Southern Railway to construct works and acquire lands; to extend the time for the compulsory purchase of certain lands; to empower the said company and the London Midland & Scottish Railway Company to construct certain works; to authorise financial arrangements with respect to certain works and facilities to be provided by the Southern Railway Company under an agreement with the Treasury; to raise additional capital; and for other purposes,' and 'A Bill to empower the London Passenger Transport Board to provide certain services of trolley vehicles; to construct new works; to acquire lands; to raise additional moneys; to confer further powers on the board; and for other purposes,' approves thereof with such modifications (if any) as may be agreed to by the directors and sanctioned by Parliament."

Mr. Eric Gore-Browne seconded, and the resolution was put and carried unanimously.

A vote of thanks to the Chairman, to the Directors, to the General Manager and the staff, was moved by Mr. Leslie Boyce, and seconded by Commander Inglefield, and carried unanimously. The Chairman suitably replied, and the proceedings terminated.

GREAT NORTHERN RAILWAY COMPANY (IRELAND)

Improved results—Road transport services—Diesel railcars—Buffet cars

The ordinary annual general meeting of the proprietors of the Great Northern Railway Company (Ireland) was held in the Grosvenor Minor Hall, Glengall Street, Belfast, on Thursday, February 27, 1936, Mr. William Burton Carson (Chairman of the company), presiding.

The Secretary (Mr. F. C. Wallace) read the notice convening the meeting and the auditor's report.

The Chairman said:—Ladies and gentlemen, though several weeks have passed since the death of His Majesty King George V, I feel sure the shareholders would like to join in the world-wide expressions of sympathy. I shall ask you to stand for a few moments in silence in memory of one who was, in every sense of the word, the best and most loved King the country has ever known.

The directors' report and statement of accounts for the year 1935 have been in your hands for some time and I presume I may take them as read. Before dealing with them, however, it is my melancholy duty to refer to the losses which the company have sustained by the death of two of their directors. Sir Lingard Goulding, who became Chairman in May, 1934, died last June after a brief illness. He was so well known to the public that I need not dwell upon his many outstanding qualities, but I must emphasise how much we owe to him for his wise guidance during the past two critical years. In December, Colonel Madden also died very suddenly. He had been a member of the board for 27 years and always took a keen interest in the affairs of the railway and the welfare of the shareholders. Sir George Clark, who retired from the Chairmanship and the board in May, 1934, was only spared a short time to enjoy his well earned rest and passed away last March.

As stated in the report it is not proposed to fill the vacancy caused by Sir Lingard Goulding's death, thus reducing the board to the statutory minimum number of nine. Mr. Raymond A. Burke, D.L., has been co-opted to fill Colonel Madden's place: he has had a large experience in transport affairs and I am sure will prove a valuable addition to the board. Your directors have honoured me by electing me as their Chairman and I need hardly say that I propose to devote all my energies to furthering the interests of the company, and I am sure you will be glad that I have the great advantage of Lord Glenavy's assistance as Deputy Chairman.

I shall, as is usual, deal briefly with the principal items in the accounts, which reveal a steady, if slow, improvement in the company's business, the final result showing an increase over 1934 of £63,490 in the balance available for interest and dividend charges, but unfortunately this is still £9,464 short of meeting the debenture interest and guaranteed dividend in full, and once again the preference and ordinary stocks amounting together to the large sum of £6,000,000 have to go without any return whatsoever. No dividend on either stock has been paid since 1931.

Traffic Increases

The increase in the gross railway receipts amounted to £67,681, or 6¾ per cent. Passenger train traffic increased by £24,225, or 4¾ per cent., goods train traffic was up by £40,322, or 8¾ per cent., and the joint lines and miscellaneous receipts increased by £3,134, or 8½ per cent. The number of passengers carried increased by 579,735, and a particular feature is the increase of 81,076, or 34 per cent., in the number of workmen carried. Merchandise traffic is up by 26,881 tons, and in mineral (including coal) traffic the increase is 2,287 tons. The number of live stock carried shows an increase of 107,996.

As these figures indicate, the general process of recovery, while not as rapid as we would desire, has been steady in all classes of traffic due mainly to some improvement in trade, and to the effect of the legislation in the Irish Free State—to which I will refer later. While these traffic figures in themselves afford some measure of encouragement, yet, compared with 1931, much leeway has still to be made up. For example, the traffic receipts fall short of those of 1931 by about £297,000, and the number of passengers by 298,500, while the goods train traffic, including minerals, was less by about 292,000 tons. The traffic expenditure at £961,819 is £26,000 more than that incurred in 1934, but, having regard to the increased volume of traffic and to the necessity for better maintenance of our rolling stock, it cannot, I think, be considered as unreasonable. The percentage of traffic expenditure to traffic receipts was 92·56 for the year compared with 96·02 in 1934.

Bus Services

The working of our passenger road motor services shows a profit of £8,437, a welcome improvement on the results in previous years. Our services in Northern Ireland were

taken over on October 1 last by the newly formed Northern Ireland Road Transport Board and our operations are now confined to the Irish Free State, with the exception of three or four cross-border services worked, by arrangement with the Road Transport Board, into towns in Northern Ireland adjacent to the border. The renewals of the older omnibuses taken over from operators whose services we acquired have, I am glad to say, been completed. Our vehicles are now in first class condition, and, I think I may claim, are most efficiently operated. Many of our buses are now fitted with diesel engines, but during the past year a tax of 8d. per gallon was imposed on the fuel used by those vehicles, which in a full year will involve an increase in running costs of about £3,500. Nevertheless, the buses fitted with diesel engines are the most economical to operate.

Hotel Improvements

The business done by the hotels, refreshment rooms and dining cars continues to show improvement, and the net receipts have increased by £911. This shows that the public appreciate the undoubted comfort of our hotels, and the catering in our refreshment rooms and on the trains. We are continuing to make improvements in all branches of this department, and at Rostrevor Hotel are installing hot and cold running water in the bedrooms on the second floor and an additional bathroom; also providing better facilities for excursion parties.

The final result of the year's working shows a total net income of £140,132, which requires to be supplemented by a sum of £9,464, appropriated from credit balances—taken from miscellaneous accounts—now released, in order to meet fixed charges, debenture interest, and the guaranteed stock dividend.

Northern Ireland Road Transport Board

The Road and Railway Transport Act (Northern Ireland) received the Royal Assent on July 16. Its main provisions are based on the recommendations contained in the Report of Sir Felix Pole referred to by the Chairman at our meeting last year, and embrace:—(*a*) The establishment of a Road Transport Board to operate all road public services in Northern Ireland; (*b*) the setting up of a standing joint committee to secure co-ordination of rail and road services in the public interest and the elimination of all wasteful services. It consists of six members—three representing the Road Board and three the railways; (*c*) the establishment of a pooling scheme under which the receipts (after deduction of working expenses) of the railways and of the Road Board will be shared in the manner laid down in the appendix to the Act. It takes effect from January 1 last.

The Road Board commenced its operations on October 1 last, when, as I have said, it took over the omnibus and lorry undertakings of the five principal operators in Northern Ireland (including those of the three railways) on terms which were fixed by an independent valuer. The value of the vehicles and premises thus disposed of has been written out of the capital suspense account in our General Balance Sheet, and Northern Ireland Road Transport 4 per cent. stock in satisfaction thereof has been allotted to the company since the accounts were closed. Although the pooling scheme will be retrospective as from January 1, it will naturally take a considerable time to bring to completion, and I can therefore express no opinion at this stage as to how it will financially affect this company. As I have just mentioned, it is the duty of the company under the Act to work in co-operation with the Road Transport Board in co-ordinating the respective services. Your directors, in the interests of all concerned, are determined to do this to the best of their ability, and to carry out the provisions of the Act not only in letter but in spirit.

Lorry Services in the Free State

In the Irish Free State we acquired, during 1935, the licences of all the principal lorry services operating in our territory, and these are gradually being co-ordinated, so that, while eliminating waste, they will provide a service most suitable to the public needs. The value of the assets transferred has been agreed in every case. The compensation in respect of the businesses acquired has been settled in the majority of cases, and negotiations are proceeding in the remainder.

More Diesel Railcars

Your directors are always seeking more economical means of conducting the company's business and, in pursuance of this policy, another diesel rail car unit was built during the year for suburban services. The results have so fully come up to our expectations that we now have two more under construction. In addition, the experiment of operating rail buses on sections of the line where the traffic is so sparse as not to warrant the running of steam trains has proved very successful.

Buffet Cars

It is the directors' policy to keep the rolling stock up to date, and during the year eight new carriages of the most modern type, with steel panels, have been put into service. An innovation, so far as this company is concerned, will be the introduction very shortly of two buffet cars which are just now nearing completion in our works. Following what is now the most up-to-date method of heating railway carriages, air conditioning equipment was installed in the new first and second class coaches recently put into service. This was found to require some adjustment, as the result of the exceptionally cold weather experienced this winter, but the system is now working much more satisfactorily and is a marked contribution to the comfort of passengers.

Wages and Salaries

You will doubtless have seen in the newspapers that there have been meetings with the employees' unions on the subject of a modification in the 10 per cent. deduction from salaries and wages which has operated since May, 1933. Our representative has insisted on a fair account being taken of our financial position, showing, as it does, that we are still unable to earn enough not only to cover debenture interest and guaranteed dividend, but to give any return on the preference and ordinary stocks, and I think the company's staff must see that we simply cannot afford any increased expenditure on salaries and wages. I might perhaps here refer to the heavy cost to the company of social services, under various enactments, from which our employees directly benefit. National health and unemployment insurance, and widows' and orphans' pensions cost us last year over £10,000 which, this year, under recent legislation, will be increased by about £3,000. In addition, a Bill entitled "Conditions of Employment" is likely soon to become law in the Free State, and its provisions will, it is estimated, involve a further annual expense of £5,000.

Prospects

As regards the future, I trust that the recovering tendency of the last two years may extend in volume. This can only be achieved by the unremitting efforts of the directors, chief officers and staff, and the co-operation of the stockholders. I should like to reiterate what Sir Lingard Goulding said at our meeting last year that all stockholders should make the utmost use of the railway and urge their friends to do the same. It is not a moribund concern. In rates and fares we are giving facilities, more perhaps than the public realise, and are always trying to develop business. We have enlarged our schemes of advertising, including the exhibition of a series of pictorial posters of attractive design, this particularly at places in Great Britain, with a view to developing tourist traffic, but the stockholders could also do their share on these lines and so help to bring back the company to its rightful position of being able to earn some dividend. In conclusion I should like to thank the large number of stockholders, many of whom could not attend this meeting, who gave proxies in favour of the directors: such support is encouraging to the board and is much appreciated.

On the motion of the Chairman, seconded by Lord Glenavy, the report and accounts were adopted.

LONDON MIDLAND & SCOTTISH RAILWAY COMPANY

Traffic recovery—More permanent economies—Railway rating position—Value of new works under the Government guarantee

The thirteenth annual general meeting of the London Midland & Scottish Railway Company was held last Friday, February 28, at Friends House, Euston Road, London, N.W.1, Sir Josiah Charles Stamp, G.C.B., G.B.E. (Chairman of the company), presiding.

The Secretary (Mr. Owen Glynne Roberts) read the notice convening the meeting.

King George V

The Chairman: Ladies and gentlemen, before discussing the company's business, I must refer briefly to the passing of Our Gracious King George, not because I can add materially to the innumerable national tributes to his memory, but more especially from the particular point of view of our company. Mainly by his frequent journeys to the north, he became acquainted with a number of our staff, and his personal solicitude for them as well as his general interest in the welfare of our line made him much more than our most distinguished traveller, and we think of him as a Royal friend who will be sorely missed by many.

To Our Gracious King Edward VIII, we express the same respectful homage and service as we gave to his illustrious father.

You will have seen from the report, which has been in your hands for some days, and which I presume you will take as read, that on December 9 last the company suffered a great loss by the untimely death of Sir John Field Beale. Sir John was appointed Solicitor to the Midland Railway 35 years ago, became a Director of that company in 1919 and had been a Director of this company since its incorporation. He had a wide business experience, an unerring instinct for essentials, and a rare gift of concise exposition. His wise counsels were always at the service of the company, and he will be greatly missed.

Results of the Year

For the third year in succession we have shown an improvement in net revenue, and there are hopeful signs that our period of depression, which reached its worst point in 1931-1932, is steadily passing. The chief factor in our prosperity must always be the level of railway traffics, and with the exception of parcels traffic, to which I will refer later, each section of the traffic receipts further improved in 1935 and resulted in a total increase of £1,084,000, of which passengers contributed £426,000 and merchandise of all descriptions £658,000. It is interesting to compare this year's figures as regards both receipts and volume of traffic (in terms of passenger and ton-miles) with those of 1929, our nearest good year, though not our ultimate ideal, bearing in mind that 1935 receipts were £11,500,000, or nearly 16 per cent. below the 1929 receipts. The incidence has been unequal, for while in the six years passenger volume increased 2 per cent., the receipts declined 14 per cent., and merchandise, with a decrease of 12 per cent. in volume, declined 18 per cent. in receipts.

Expansion of Traffic

Passenger traffic expands more readily to lower charges or improved facilities than merchandise traffic does, so that the carefully designed changes in fares have created new passenger traffic, and in that we have been aided by a Sales Department, which has been greatly assisted by the rank and file of the company's staff, who have been untiring in their enthusiasm in retaining old and obtaining new passengers. Merchandise traffic can only to a limited extent be created by the provision of facilities and rates which will foster new traders or new flows of old trades, but we do all we can to encourage such traffic, consistently with our obligations to provide comprehensive services for all classes of traffic and to afford equality of treatment to all by means of the classified scale of charges in the interest of industry as a whole. I recognise with gratitude the action of certain of our large industries who with the knowledge that they could divert to road parts of their traffic, particularly those classified highest for rate purposes, have refused to do so because they realise the national advantage of fully supporting the comprehensive railway service even though a profit would be secured, for at least a time, by selecting for rail conveyance only the lower grade and lower rated traffics. It is a case where not grasping an immediate saving on particular classes or streams of traffic may prove a good economy for the customer in the long run.

But to return to the traffic receipts position; last year's total results, despite the fall in parcels receipts in the second half of the year, were in excess of our expectations, the heavy classes of traffic showing a greater recovery than we had anticipated, mainly due to merchandise but assisted by coal, though in part the latter was abnormal. This year the improvement has so far been well maintained, and for the first eight weeks we have an improvement of £240,000 over 1935.

Railway Expenditure

Railway expenditure decreased by £42,000, but as the corrected item of rates shows a reduction of £820,000, which I will deal with later, I confine my remarks at this stage to the remaining items which show an increase of £778,000, made up of:—

Maintenance	£284,000
Operating	£285,000
General charges (and other)	£209,000

The additional maintenance charges include an increase of £130,000 in renewal provisions, mainly due to the rise in prices reflected in them, and the balance of £154,000 is more than covered by the increase in rates of wages, and prices of materials and the increased outlay on maintenance and operating work performed was more than offset by economies in working.

Might I here correct certain published comments on our accounts which misunderstand the method we are required to adopt in dealing with renewal fund charges. The net charge to any year for renewal work performed is independent of the outlay in that year, but the actual outlay must be charged as working expenditure of the year and adjustment made by means of transfers between the renewal fund and the working expenditure. An increase or decrease in the transferred amount from the renewal account merely counterbalances the increased or decreased outlay in that year, and the net charge to revenue account is unaffected by such variations.

Savings Continued

The operating expenditure had to meet an increased wages bill of over £300,000, but against this £15,000 was saved in other directions, notwithstanding a growth of nearly three millions in train miles. The enthusiasm shown in obtaining traffic was well shared by those who worked it, and I need not enlarge on the excellence of this operating result, which would have been even better were it not for the extreme weather conditions in December, which caused an additional outlay of £75,000. Had it not been for increased prices of labour and materials these two large items of expenditure, representing £45,000,000, or 73 per cent. of our receipts, would show an actual reduction on the year, notwithstanding the growth of work performed, and this indicates the permanent nature of the economies of recent years, which I dealt with at length a year ago. General charges require separate mention, and the increase under that item is due almost entirely to the company's contribution to the

superannuation fund. We had a valuation of the fund as at December 31, 1934, and while the actuarial inquiries are not complete, it is obvious that the charges on account of it must be increased. There are two main reasons for this: first, the minimum pensions payable to those in receipt of smaller salaries have cast upon the fund a heavier burden than was calculated when it was formed in 1924, and secondly, following common experience, the average age of retirement has tended to fall, but how far these factors are permanent is a matter of uncertainty. We have provided for the liability of 1935 on the assumption that the circumstances will not alter materially, and the position will be reviewed from time to time. I should add that this affects the pre-1935 membership only, as last year we obtained an amending Act of Parliament which increased the contributions of members joining the fund after December 31, 1934, to rates which, with the company's equivalent contributions, are adequate to meet the actuarial liability of the benefits. The company are guarantors of the fund, and as regards the pre-1935 entrants the additional liability falls upon them, and in accordance with the practice of the company this is met currently on actuarial advice as to its extent.

Ancillary Businesses

I need say little of our ancillary businesses. Road transport, hotels and catering, and steamboats, each show a net improvement despite increased wages, the shipping the good one of £32,000 over last year's result, which was itself the best of any year in our history. Docks, notwithstanding the depression in the export coal trade, have turned the corner and made a small direct contribution to your net revenue. Collection and delivery has increased its debit balance by £12,000, but as I have told you on several occasions, this service has its value to us in the door-to-door transport it provides, and apart from that it is only possible to work our terminals economically by clearing them currently by our own or contractors' vehicles to and from our depots. It is interesting to note that in 1934 the German Railway concluded an agreement with a group of road hauliers whereby they would receive an annual subsidy from the railway of Rm. 70,000,000 to enable them to provide collection and delivery services at low charges. The object of this arrangement was to provide users of railway transport with a door-to-door service, which it was hoped would bring back traffic to the railway that had been lost through road competition. American railways are extending also in the direction of British practice in order to meet road competition.

Manufacturing Policy

Air services I will mention later, and our limestone quarry, a legacy from the old North Staffordshire Railway, no longer appears in the accounts, as this has now been leased by us on satisfactory terms. We have no desire to engage in any trading activities beyond our comprehensive service of transport, including its necessary adjuncts. I should add in this connection that I have recently had in two directions to restate our policy in regard to the complete or partial manufacture of our own requirements. Shortly, this policy is solely dictated by reasons of efficiency and economy, and while we have no desire to extend the conduct of our undertaking where supplies of requirements can be met by manufacturers at appropriate prices, we shall manufacture our own requirements where that is shown to be the more economical course in the long run. We purchase a large part of our manufactured or semi-manufactured requirements, and on the whole satisfactorily, but on more than one occasion lately we have had to countermand orders because of price difficulties. On the other hand, certain manufactures of our own have ceased where it was found that outside manufactures were cheaper and reasonable long-term assurances in regard to prices were obtainable. As regards our miscellaneous income, the item of rents, totalling (net) about £1,000,000, is maintained and even improved by £10,000, notwithstanding the continued sales of surplus property which this year represented a further credit to capital account of £370,000.

This brings me to the net revenue for the year, which at £13,027,000, including of course the £885,000 on account of rates, is £1,106,000 better than in 1934, and the best result since 1930. It was, I may point out, only £400,000 below the 1930 result, although the gross receipts of 1935 were £7,800,000 below those of 1930. In comparing the result with other years I emphasise again that despite the difficulties from which we are emerging the company as a unit, as a machine, as a living organisation, is a better one than at any time in its history, and we are now reaping the fruits of a continuous process of readjustment to changing conditions which would not have been possible without the huge programmes of works we have undertaken with your support and confidence.

Local Rates

In each annual report from 1931 onwards we referred to the fact that the charge to expenditure for rates was based on the valuations at March 31, 1931, which were in force pending the determination of new valuations under the Railways (Valuation for Rating) Act, 1930, and I more than once indicated that we had every reason to expect substantial reductions in the final settlement. A little confusion as to the present situation has arisen in many minds because it has been fully realised that the legislature has made two quite distinct changes, one dealing with the basis upon which rates are paid and the other with the direction to which the rates payable on that new basis are applied. The object of the first was to bring to an end the chaotic and piecemeal method of arriving at the valuation of railways in every little area through which the railway runs and to substitute an assessment of the valuation of the railway as a whole, afterwards to be apportioned among the various local authorities—a reform recommended by a Royal Commission as long ago as 1867. The rating authorities sought to interpret the new Act so as to revise to our disadvantage the fundamental principles upon which rating has hitherto proceeded.

Southern Railway Decision

Last year I told you that the Railway Assessment authorities so far from reducing our valuation had made provisional valuations of the property of the company (with certain exceptions) in England and Wales totalling £5,000,000, as compared with a figure of about £3,700,000 at March 31, 1931. We challenged this amount and claimed that on a true basis the total should be £750,000. The matter has not yet been brought to a hearing because in the meantime the valuation of the Southern Railway, after confirmation by the Assessment Authority, was the subject of an appeal by that company and a cross-appeal by local authorities to the Court of the Railway and Canal Commission. This valuation was fought as a test case for all the railways to settle the principles to be adopted, and was decided on the main question of principle in favour of the railway company, and on appeal to the House of Lords that judgment was affirmed last month. This result appears to justify the opinion your board expressed in February, 1932, that substantial reductions should be secured in the company's liability for rates from April 1, 1931. I need not here discuss the merits of the questions which arose, beyond mentioning that it is now clearly laid down that the rateable value is the rent which, on the basis of the net receipts, a tenant would be expected to pay, who has to provide the rolling stock and other chattels. That has all along been our contention, and it will be obvious to you that the depletion of net receipts, due largely to competition of another form of transport which pays neither rent nor rates for its track, must reduce the rental value of a railway line.

While the L.M.S. case cannot yet be discussed in detail, the fact that the main principles of its valuation have now been determined has justified your board, after taking advice, in bringing to credit of 1935 a round sum of £885,000 on account of the corrections for that year. The necessary further correction will be brought to account as and when final figures are available for 1935 in, I hope, 1936. So far as the years 1931 to 1934 are concerned and the adjustment of 1935, it is the intention of your board to retransfer

the repayments to reserve and not bring them finally to account in the form of profits for 1936.

If all the rates had been paid to local authorities in the ordinary way, the question of arrears and repayments of overcharges would have been relatively simple. You are aware, however, that one-fourth only of our liabilities for rates is now to the local authorities, the other three-fourths being transferred to the Freight Rebates Fund administered by the Railway Rates Tribunal. The Freight Rebates Scheme was designed by Parliament, as part of the derating arrangements introduced under the Local Government Act, 1929, to revive the productive and competitive powers of the heavy industries by lightening them of the burden of local rates which pressed heavily upon them. Briefly, the derating arrangements relieved agricultural land and buildings of all rates and reduced the rating payments of productive industry by 75 per cent. Railways were also directed by statute no longer to pay their rates to the extent of 75 per cent. of their existing payments to local authorities, but to pass the so-called "reliefs" into a special pool, which was to be used to make equivalent reductions in transport charges to certain traffics of agriculture and the heavy industries. So far as railways (including stations and factories) were concerned, therefore, their 75 per cent. proportion of rates was required to be paid into the Freight Rebates Fund for distribution in rebates from railway charges in proportions laid down in the Act of 1929, the actual percentage reductions being left to the discretion of the Railway Rates Tribunal.

Principle of Derating

The Chancellor of the Exchequer, in introducing the financial provisions dealing with this matter, stated:—"The railways concerned, I am glad to say, have agreed in principle to this course, and I am indebted to the heads of those great concerns for the trouble and goodwill which they have shown. I informed them at the outset that the principle was that the railways were to get nothing out of this relief, they were not to gain and they were not to lose. They are to gain only in the sense that if they carry more traffic as the prosperity of the country improves it will give a stronger assurance of employment to their workpeople. But the relief is a relief which they are to pass on to the industries concerned." My evidence before the Royal Commission on Transport in December, 1928, explaining the scheme set out this aspect clearly and ended by stating "it is merely a device for assisting certain trades."

As far back as November, 1930, the railway companies indicated to the Railway Rates Tribunal that they anticipated there would be a substantial reduction in the amount payable by them into the Railway Freight Rebates Fund as from April 1, 1931, and in submitting their estimates of rate relief accruing to this fund, for each subsequent annual review of the rebates scheme, the companies explained that in their view the rate relief payments (which in turn depend upon rate payments) would be less than one-half of the amounts provisionally payable on the basis of the old valuations.

Overpayments by Railways

Having regard to the terms of the statute the Railway Rates Tribunal decided that the payments to be made into the fund must continue on the basis of the old valuations (the Act providing for adjustment following the new valuations and rates thereon when finally determined). Similarly, in our annual accounts we were advised that the amount to be brought to charge for expenditure in the years 1931 to 1934, inclusive, must be the payments for local rates, and the payments to the derating fund on the basis of the old valuations. When the valuations and rates thereon are finally determined, the over-payments to local authorities and the derating fund respectively will be debts due to the company. No doubt some reasonable and convenient arrangement will be made as to the manner in which such overpayments are to be repaid, but I cannot at this stage give any precise information as to this or as to the exact figure of the amount due to the company. I can only say that as a result of the advice we have obtained, the payments due back to the company will be substantially in excess of 50 per cent. of the provisional payments made during the five years. So far as can be foreseen at present, the company can anticipate a similar saving for the next quinquennial period.

Freight Rebates

You may ask what effect this will have upon the future operations of the Freight Rebates Scheme. That again is a difficult question for me to answer at this stage, and while we shall take care to do nothing which would cut across the intentions of the Government when they introduced derating legislation, we shall also take care that your position is not prejudiced owing to the fact that the necessarily deliberate process of the law entailed payments on account being made substantially in excess of the actual liability as subsequently ascertained.

I should add that the rebates are not earmarked to the traffics of the particular companies, but by the operation of the scheme they are pooled and distributed regardless of the contributions from each company, 70 per cent. of the rebates going to export coal traffic (which for this purpose excludes coal exported to both Northern Ireland and the Irish Free State) and coal for iron and steel works, 20 per cent. is payable to selected agricultural traffic and 10 per cent. to certain other industrial traffic, mainly raw materials for iron and steel works and pit props.

There has been much loose talk of the correction due to the House of Lords' decision representing some sort of unexpected windfall or advantage to the railway companies. As you know from what I have told you at previous meetings, the position is exactly the contrary. The railway companies have suffered from over-payments for a period of five years, and had the true valuations been available in April, 1931, no question of over-payment would have arisen (apart from ordinary minor corrections). In each of the years 1931 to 1935 the correct contribution under these heads would have been paid to the Freight Rebates Fund, and rebates on a more modest scale in accordance with the funds available only, would have been paid under the Government scheme to the selected industries.

Rating Credits Justified

Criticisms on our action in bringing reductions of rates to account in the year 1935 have tended to cancel each other out. But in one case our action was described as "a rather panicky haste to expend the equivalent of the reliefs," it being added that it would seem the reliefs are regarded as "a liability to be got rid of as soon as possible instead of an asset to be conserved." This means one of two things, either that we should, in our accounts, put the expenditure at a greater figure than the law considered correct, or that having shown what we considered to be the true net result, a matter on which our auditors have necessarily something to say, we should then have proposed to put to reserve this part of the earnings of the year, despite the fact that having done so the 1923 preference stockholders would thereby have been prejudiced. Needless to say, the board could not agree to recommend to you either of these alternatives.

As regards the accounts, the present position of this complicated matter is that, as I have already stated, £885,000 on account of the year 1935 has been brought into the net revenue of that year and the adjustment of that "on account" figure, together with the corrections for 1931 to 1934, will be dealt with subsequently.

Capital Expenditure

Those of you who attended the British Railway Stockholders' Union luncheon in November, or who read the December issue of the *Railowner*, will know that on that occasion I dealt at some length with what was then a project for a loan guaranteed by the Government to enable certain developments to be undertaken which would otherwise not have been entered upon at the particular time. I also outlined what were the principles underlying such expenditure from our point of view. The total cost of the

execution of the works proposed to be undertaken by the four companies is £26,500,000, and £9,000,000 of this sum is to be borrowed by the L.M.S. Company from the Finance Corporation formed under the provisions of the Act, and these works have to be completed by January 1, 1941, or within such further period as the Minister of Transport may allow.

Proposed New Works

So much publicity has already been given to the works to be undertaken that it is perhaps unnecessary to detail them here, but for the benefit of those who would like to have the particulars afresh, our works are as follows:—

(1) Electrification of portions of the company's railway in the Wirral Peninsula and the establishment of through passenger train working over that railway and the Mersey Railway between Liverpool and New Brighton and Liverpool and West Kirby (including the provision of rolling stock and other equipment).

(2) Conversion of Stonebridge Park (Wembley) power station to 50 cycles frequency and alterations of substations and other works and equipment.

(3) Construction of 369 new steam locomotives.

(4) Construction of 270 new carriages.

(5) Reconstruction and replanning of the Euston terminus.

(6) Installation of colour light signalling between Euston and Willesden Junction, and at Birmingham, Crewe, Preston, Rugby, Stafford, Warrington and Wigan, provision of intermediate block sections at three points between Crewe and Euston, extension of track circuiting and other signalling works.

(7) Improvement of accommodation at various passenger and goods stations.

There is much I could say and have, in fact, said regarding justification for the expenditure involved so far as the L.M.S. Company is concerned, and with the limited time at my disposal today I will confine myself to saying that the cardinal principle in undertaking any new work is the maintenance and increase of net revenue. Every such scheme is judged by that test, and the advantage to us of the new loan is that it brings inside that test works which would not otherwise have been justifiable at this time. As you know, the money has now been raised by a 2¼ per cent. loan at 97 for a period of 16 years. Repayment will present no particular problem, because the normal renewal allowances on much of the expenditure will automatically provide part of the capital in that time, and it is our intention to make annual arrangements during the period which will complete provision for repayment at maturity.

Administration

You will remember that by resolution of the shareholders in 1923, the directors' remuneration was fixed at £35,000, the amount to be divided among the respective members at the discretion of the board. Five years ago I told you that they proposed to reduce the debit in the accounts by 25 per cent., and this was accordingly done forthwith. There will now be a restoration of one-half the cut then imposed on individuals, but as there are changes in the total numbers, we have been able still further to reduce the debit in the annual accounts, and make it £10,000 less than the original vote, viz., £25,000 per annum. Sir Hector Munro, one of the local members of the Scottish Committee, died on December 15 last, and his place has been taken by Sir Robert Bruce, who is retiring from the editorship of the *Glasgow Herald*.

Operating Efficiency and Acceleration

We have continued to accelerate our passenger services, and in the past few years by retiming trains we have reduced journey times by 32,220 minutes per day. We then had no start-to-stop runs with an average speed of 60 miles per hour, but now we have 27 runs, or 2,360 miles daily, at over this speed. Local and stopping services afford less scope, but progress is being made here also. The tighter schedules and more numerous trains have not adversely affected punctuality. Despite the weather conditions of December, which were the worst for many years and spoilt many good results for the year, express train punctuality improved by 10 per cent. On one day in 1935 a figure of 99 per cent. punctuality was reached, and the weekly figure of 96 per cent. was attained on seven occasions. The spirit of the rank and file in responding to the stimulus to attack this problem is worthy of the highest appreciation. Freight train speeding up now covers 475 trains and saves 17,400 minutes daily—in four years we have increased the automatic brake fitted freight trains by 79 per cent., and this has enabled us to give many more one-day transits over long distances.

Locomotive Policy

I will not apologise for referring again to our locomotive policy and the more intensive use of engines, but 1935 has seen the fruition of earlier preparation in some striking changes. I told you last year that as a result of reorganisation in many directions the numbers had come down from 10,316 at amalgamation to 8,000 and they are now 7,885, the types going from 393 to 206 then, and now 185, and when all orders in hand are completed the number of types will fall to 150 and the stock to 7,554. It must be remembered that the train miles increased by 2¾ millions. We have obtained a further increase of 5 per cent. in the average mileage per engine in use. The more powerful engines have enabled us to reduce double heading for passenger trains by over 20 per cent. in the year. The chief contribution to these improved operating results is the policy of new construction, improved methods of scheduling engine workings, modernisation of sheds and the concentration of running repairs. With the greater work performed by locomotives it is gratifying to find that there was an actual reduction of 19 per cent. in locomotive casualties, the number being the lowest recorded by the L.M.S. Our locomotive policy needs no more extended justification, but you may be interested if I pass on to you a comparison made on high authority. From 1931 to last September 793 new steam locomotives were put into service on the L.M.S., with its route mileage about 7,000, and this exceeded the number of new locomotives of all kinds, steam and electric, put on the United States railroads with a route mileage of 250,000 in the same period. Despite the greater demands upon the locomotives the coal consumption per engine mile continues to fall, and this is an important figure in our economies. Shunting mileage has attained its lowest figures in 1935, and the wagon miles per total engine hour, which are a good index of the efficiency of freight train operation, have maintained their improvement.

I have drawn attention in previous years to the tendency of the number of freight train consignments per ton to increase. In 1935 there was a further increase of 3·2 per cent., thus adding to the work to be done, but despite this, owing to improvements in terminal equipment and to analysis of operations, the hours occupied per ton at the sheds decreased 1·63 per cent. in the year.

The passenger train mileage increased by 2·6 per cent., and the justification for this has been the increase of 2·3 per cent. in the passenger journeys and 2·3 per cent. in receipts. The fall in revenue from first class fares has been arrested by the reduction in fares, for with an increase in the distances travelled a small increase in receipts was achieved.

Parcels Traffic

Included in passenger train revenue are the receipts from parcels traffic, and here there is a less satisfactory story to tell, despite the fact that the trade of the country has improved. This is due to the action of the Government in announcing as a "Jubilee gift," a concession which was either highly competitive or else mainly at our expense. The Post Office decided as from July 1, 1935, to reduce their rates for inland parcels and extend the weight limit from 11 lbs. to 15 lbs., and the railway companies were faced with the necessity for revising their parcels charges in order to meet the situation, which was further aggravated when road transport undertakers followed the lead of the Post Office. It was apparent that if the existing rail rates continued to apply there was likely to be a very heavy diversion of traffic owing to the new postal scale of rates being in

many instances below those which railway companies were charging. After careful consideration the railway companies decided to reduce the owner's risk scale for parcels weighing up to 18 lbs. to a competitive level with the new Post Office scale, with a view to safeguarding rail revenue to the greatest possible extent, but it is not yet possible to estimate accurately the ultimate effect of the reduced rates on L.M.S. revenue from their own parcels traffic. Another effect of the new parcels post scale is that, although we are handling considerably more postal parcels, because our receipts are based on a percentage of the Post Office receipts, and as the latter are less, we are for the present receiving less than before, and so bearing a part of the actual concession given by the Post Office. This matter is at present in course of negotiation with the authorities, and I will, therefore, refrain from further comment upon it.

Passenger Amenities

Those of you who travel regularly over the line have no doubt noticed the gradual change in the nature of our passenger accommodation, but it is the returning visitor from overseas who sees the railway at intervals who most notices the change which has taken place and is continuing. Much of it is made up of little things, such as additional catering services, separate kitchen cars, faster trains, better riding due in part to the track and in part to the coaches, the wide low windows now used, the improved upholstery and springing of the seats, the arm rests and shoulder lights in long-distance third class coaches, the additional and improved lavatory accommodation, and the seat reservation arrangements. It is by these various means that the extra volume of passenger traffic was obtained and exceeded by some 2 per cent. that of 1929. In that I have regard to distance as well as numbers, and the total passenger miles, 7,837,000,000, is a striking achievement, representing 21,000,000 miles of passenger travel per day the whole year round, which, girdling the earth, would outdo a score of Shakespeare's Pucks.

Road Competition

The Road and Rail Traffic Act of 1933 made a beginning in reducing the chaos of freight transport on the roads to some sort of order; the process is now developing, and the various provisions of that Act are having their effect upon running costs. But the rate of increase of vehicles upon the road is not yet showing much reduction, and at present the net effect of increasing costs has been to intensify competition, for many operators are cutting rates still further in order to secure a sufficient volume of trade to cover their new expenses. A great deal still remains to be done before it can be said that road and rail competition is upon an equitable basis, and those interested only in road transport are beginning to develop a new kind of propaganda against the railways. We find that even responsible representatives are repeating old fallacies and discovering new ones. I may briefly refer to some of these in order to check them from gaining currency again too easily.

Road Propaganda

The general statement is often made that recent road transport legislation has consistently "favoured" the railway companies, whereas it has merely gone some way to redress injustice to railways. It is really no favour to us to have a move made part of the way towards equality. We are told that by the Act of 1929, railway property was derated, but not that of road transport undertakings, although the premises were used for exactly the same purpose. As you know from what I have said, we were not derated in any effective sense, for we merely had to change the direction in which our rate payments were made. In any case, road transport is not subject to rates for its permanent way. Again, it is said that the assessment of railway permanent way for rateable purposes has been progressively reduced since the War, and that the consequent losses of yield have been largely recouped by the tax on motor fuel. The answer to this is that the fall in the reduction of the assessment was not by favour or by legislation, but because the rental value itself fell, and this fall was largely due to their competing industry, which pays no rent for its permanent way. It has even been said that under the Derating Act, railways were granted a direct subsidy of 10 per cent. by Parliament to apply to certain classes of traffic, some of which were regularly carried by the road. As a matter of fact, four-fifths of the freight rebates go to aid export coal and raw materials of the iron and steel trade, and only a part of the remainder is paid to traffics in any way competitive with road haulage. A further partisan statement is that the railway companies have the right to object to all road transport services, both for volume and quality, and in respect to passengers also for the charges made, whereas road transport operators are unable to object at all to the way in which railways are operated, or to reductions in their rates and charges. I would ask you to remember that Parliament controls all railway rates and charges in one way, road goods charges not at all and road passenger fares in another much less effective manner. Any application of railway treatment to all transport would hardly be relished by the road interests. The railways have no power to object to some 70 per cent. of the goods vehicle licences; and the difference of treatment when new roads and new railways are proposed to be built is great. I have not, for instance, seen any case where on the construction of a new roadway which would cause diversion of traffic from rail to road compensation was required to be paid to the rail. On the other hand, we had to pay such compensation when a new railway caused diversion from road to rail and affected the dues of local authorities. Recently the construction of the Mersey Tunnel placed on us a heavy burden for rates to subsidise it, and it is exempted by statute from paying any local rates.

Road Transport Charges

The suggestion that the railways are now road monopolists is quite wrong. By far the greater part of road transport has nothing to do with the railway; and the railways do not own more than half an interest in any bus company. It is not true to say that the road transport industry pays 25 per cent. more "taxation" than is due for services rendered, because this does not allow for the rent of roads used nor any rates upon them, and about one-half of motor and fuel duties are paid by private car owners and not by commercial road transport. It is not true that railways can arrange their tariffs of conveyance charges at any level they wish, and as for the suggestion that they "work behind closed doors," they are the only industry whose affairs are fully examined in public, with the right of users to criticise them. Road interests continually urge that inquiry should be made into railway matters, but this is already actually done annually by the Railway Rates Tribunal under the Act of 1921. I doubt if the road transport would agree to this control for their own business, containing as it does a limitation of profits. The community owes the railway system equality with roads in legislation, and not until adjustment on this basis has enabled the true earning value of the railways to be made effective, can any of these comparative problems be seen in true perspective.

Investments in Road Undertakings

Last year I told you that the direct dividend return from our own investments in road passenger undertakings was over 7½ per cent., and for 1935 the figure increased to about 8½ per cent. You know of the indirect results of these arrangements, and the direct results continue to improve.

London Passenger Transport Pooling Scheme

The pooling scheme of intra-London passenger traffic which followed the London Passenger Transport Act has been confirmed, and the L.M.S. Company's proportion of the total pooled receipts established as slightly over 5 per cent., and the various arrangements are working satisfactorily. During the year the Government undertook to assist in raising the necessary capital, by guaranteeing the principal and interest upon moneys to be expended upon certain works for improving and extending passenger transport facilities in the London area. An issue of £32,000,000 of 2½ per cent.

Debenture Stock was accordingly made last July for financing the works to be undertaken by the London Transport Board, the Great Western Railway and the London & North Eastern Railway. Whilst we are not directly interested in these arrangements we shall bear our pool share of the remuneration of this capital, and, on the other hand, receive our pool proportion of the enhanced pooled receipts from the various works. The question of the company participating directly in these arrangements was carefully considered with the other parties to the pool, but the conclusion was come to that the schemes proposed required priority over any possible schemes on the L.M.S.

The Coal Industry

Happily, the threatened coal strike was averted, and this is no place for me to dwell upon the disastrous effects which must have accompanied a cessation of work in the mines. But you may be expecting me to say something about the railway companies' attitude towards the suggestion made to them, in common with other large consumers, regarding an increase in the price of coal under existing contracts, with a view to facilitating negotiations for an increase in mine-workers' wages. There is, of course, a very essential difference in the position of the railway companies and the public utility companies and other industries which are large consumers of coal, apart altogether from a comparison of available net revenues. In the electric power industry, for instance, the coal clause which forms a feature of nearly all contracts under which power is supplied to consumers, provides an automatic method of passing on to the consumer increased expenses incurred by a voluntary increase in the price of coal. In the gas industry the price can be raised by undertakings under their statutory enactments, so that the additional cost can be transferred to their customers.

Similar considerations apply to other industries, but the railway companies are in no such position. They have no automatic method of increasing their charges in ratio to an increase in their costs, or of ensuring that a particular burden can be specifically covered. They are not sheltered by protection of any kind and they have a keen competitor in the road transport industry which is little affected by the change. It follows that, even if the railway companies had a ready means of increasing their charges, such an increase would, over a large section of industry, fail to bring in an increased revenue and might well result in a reduced revenue. To be effective, an increase in railway charges would probably have to be limited to the rates charged for the conveyance of coal and other heavy industrial traffic.

Hotel Undertakings

The majority of the hotels showed rather better than in 1934, but one or two exceptions, due to local conditions, brought the aggregate result to about the same as 1934. In railway catering there has been a general improvement and the provision of additional facilities has met with success.

Modernisation of our existing hotels, with the exception of some smaller ones, is now either complete or at least the work is in hand. The opening of the new wing at Kyle of Lochalsh showed so much promise that we decided to rebuild the remainder, and the rebuilt portion will, it is hoped, be ready in May. The rebuilding of Queen's Hotel at Leeds is now being pushed forward; the front portion of the old hotel is demolished and the rebuilding has already commenced; but I am glad to say it has been found possible to continue business in a restricted form in the back wing.

We have closed one of our hotels, the Midland Grand at St. Pancras, which could no longer fulfil its functions as a first-class hotel, and is now usefully occupied as office accommodation in connection with the hotels and other departments. The closing of this hotel has enabled us to improve the refreshment and dining-room accommodation at St. Pancras, which had become obsolete, and is now completely modernised. A part of the business done at St. Pancras has been transferred to the Euston hotel, where this goodwill is being carefully preserved for transfer to the new Euston.

Marine Department

As I have previously stated, the result of the working of your steamboat services is the best yet recorded, and the satisfactory results achieved have been largely contributed to by the continued results from the rationalisation of the services between Heysham and Fleetwood and Belfast, and it is gratifying to find that those between Holyhead and Kingstown and Dublin which were affected by matters beyond our control show improvement. Further, the number of vessels required in connection with our Goole and Continental services has been reduced since 1923 from 24 to 13 largely by reason of pooling arrangements with the other steamship interests engaged in those areas.

The new vessels I referred to last year being built for the cross-channel routes between England and Ireland are now in commission and afford great satisfaction to passengers and traders. In addition we are at present engaged in effecting improvements to the third class accommodation on some of the vessels to bring them into line with the latest requirements. The very extensive programmes of new steamers in recent years when shipbuilding was in a depressed condition have been more than justified by the results achieved, and we have now a fleet of first-class modern vessels. Perhaps you do not appreciate the extent to which you are shipowners; at present the number of vessels employed on the company's services is 69, with a net registered tonnage of 27,251, including the half interest we hold in Messrs. David MacBrayne Limited Western Highlands services, which have completely revolutionised transport in those waters.

Railway Air Services

I told you last year that the railway companies had associated themselves with Imperial Airways in a new company, Railway Air Services Limited, to provide such air services as are required by the railway companies. In 1935 we continued to operate a service between London, Belfast and Glasgow throughout the year, and the regularity of this service was 91·7 per cent. In addition, a new service, sponsored by the Isle of Man Steam Packet Company and ourselves, was operated between Manchester, Liverpool, Blackpool and the Isle of Man. In add, about 360,000 aeroplane miles were flown on behalf of the L.M.S. during the year.

Internal air services are still in an experimental stage in this country. For many journeys the saving of time is not great enough to justify the additional cost, but when a sea journey is involved, as in the case of our services, the advantages are much greater. Our policy is to continue these services with a view to determining the commercial possibilities of internal air routes, and to gaining experience as to the place which air services are likely to occupy in the future in a co-ordinated system of land, water and air travel, which the railways are in a position to offer to the public.

Research

In the early years of a new venture such as our scientific research organisation it was natural for me to make special mention of individual results achieved, so that you should realise in some measure the type of work on which our Research Department was engaged. On this occasion, however, I propose to refer only to the completion last December of our new research laboratory at Derby. For some years the need for improved accommodation and facilities had been growing, but we refrained from spending money on new premises until we felt confident that the Research Department could fulfil a permanent function in our organisation. Within the space of five years an organisation has been built up that has now won the confidence of the other departments to an extent that is resulting in an almost embarrassing volume of requests both for research work proper and for day-to-day scientific advice and assistance. We had little hesitation then in proceeding with a new laboratory, which was formally opened in December by Lord Rutherford

in the presence of a distinguished gathering of scientists and industrialists.

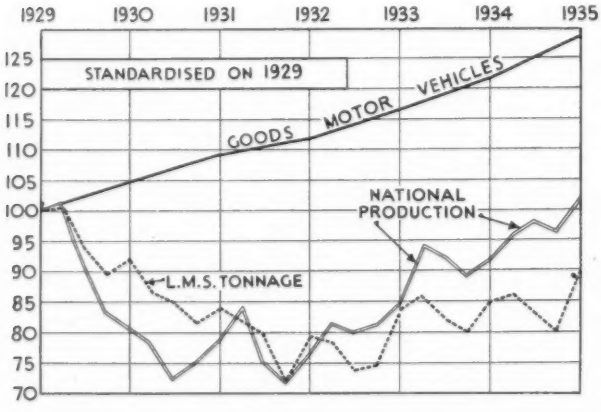
The building, which accommodates a staff of 50, is conveniently situated in relation to the company's workshops at Derby. The architectural treatment is modern in conception, and the building has been designed with a view to providing flexibility both in regard to the services and varying the size of rooms; its construction will permit the addition of another storey should the need arise. Up-to-date equipment has been provided which includes apparatus and machines specially designed for the study of our particular problems, while a library of standard works of reference and having a representative list of current journals, is available for the use of the staff. As I said at the time, this new laboratory is an objective index of the state of progress reached, and we know that it will be a sign to all our widespread departments that they have in the Advisory Committee and the Research Department the highest skill to consult on all their problems in regard to engineering and metallurgical questions, paints and textiles.

The Research Department is in no sense a rival to similar outside undertakings; on the contrary, continuing our original policy, we keep in close touch with outside research organisations with which there is free interchange of scientific knowledge and ideas. This policy has met with marked success and has enabled us to avoid much unnecessary duplication in scientific investigations.

Wages Negotiations

As I informed you last year, part of the percentage deduction from earnings of railwaymen which had been made since March, 1931, was discontinued, leaving the position then that there remained a general deduction of 2½ per cent. from the earnings of staff in all ranks. The discontinuance of this part of the deduction cost £442,000 in 1935. During the past year the trade unions have made application for the cessation of the remaining 2½ per cent. deduction, and also for the restoration of the enhanced rates of payment for Sunday duty, overtime and night work which were in existence prior to March, 1931, when the basis of such payment was reduced. This has been discussed by representatives of the companies and the trade unions, who have asked for a further meeting with our representatives at an early date. The attitude to be adopted towards the application is under the careful consideration of your board.

The prospects of maintaining and even improving British industry are good for the near future, and so long as building activity continues, despite the continued heavy weight of unemployment and the low level of foreign trade. The prospects of railway traffics should be reflected in this too, although such reorganisations of industry as the Milk Marketing Scheme nearly all reduce the demands upon transport, and the reduced coal exports are an important factor. But the problem that is still pressing upon us is shown to some extent on the graph, which continues the previous years' series of the quarterly index of production. From this it will be seen that the country is back rather beyond its 1929 position and, if anything, this index would understate the true annual figure. On the other hand, the L.M.S. tonnage, while increasing, is lagging considerably behind; but movements in national production do not coincide with movements of traffic by rail, particularly where a reduction of, say, shipbuilding or coal production is offset by the production of, say, wireless sets or artificial silk stockings or cinema films.



National production curve in relation to tonnage carried by the L.M.S.R. and goods motor vehicles

Goods Transport by Road

Even if we make allowance for the fact that railway tonnage does not refer to exactly the same ingredients as the index, we are still anxious to seek for the cause of the lag, and we do not have to look far, because we see that the tonnage of the road motor vehicles has reached a figure of nearly 30 per cent. more than in 1929, and this is in constant competition for the available traffic. This competition, even when it does not take away the traffic, often unduly depresses the charges made and lowers the receipts per unit. These difficulties are being constantly met by the greater efficiency of working and the fine spirit of your great staff, to whose response we owe so much, and they are maintaining the potential earning power of your undertaking at a very high level.

Barring, then, any untoward circumstances which would interfere with the continuation of the steady improvements we have been showing in recent years, these should combine to a fruition which will justify at length the natural hopes of our ordinary stockholders.

I now move that the report now read with the statement of accounts be received and adopted.

Mr. E. B. Fielden (Deputy Chairman) seconded.

Shareholders' Remarks

Councillor John Wilson (Accrington) greatly appreciated the action of the directors in increasing the £40 limit of value per consignment in the cash and delivery system to £100. The penny-a-mile return fare had been a success, but everybody was now wanting a penny-a-mile single fare. At present the company took three days to arrange a circular tour at that rate. So far as he could make out the company had been paying to the 231 agencies selling railway tickets an average of £954,960 from the year 1929 to the end of 1934. He believed that the stockholders could be provided with 2½ per cent. on the ordinary stock immediately. If the Government expected the stockholders to maintain the railways in a high state of efficiency and to hand them over in time of war, it should declare the company's road competitors common carriers. Further, if the Government wished through the Rates Tribunal to fix the rates on heavy materials, it should only do so subject to guaranteeing 2½ per cent. on the ordinary stock.

Mr. McAdam asked if it were possible to hold the special meeting for discussing Parliamentary Bills immediately after the ordinary meeting. He thought it would be advisable to postpone the expenditure of something like £5,000,000 on the reconstruction of Euston station until the ordinary stockholder had received some dividend. The capital outlay on road transport had been increased by £394,000, but the profit on it had been reduced from 3·22 per cent. in 1934 to 2·68 per cent. last year. The figures in the hotels account showed that receipts were up £28,830, while the expenditure was up by £36,618. That on the face of it showed a slight loss, but the account showed an increased profit of £16,000 arrived at by taking £29,930 from the renewal account. He challenged the company to publish a list of hotels which were paying and which were not, and the profits and losses in each case, apart altogether from the restaurant cars. He still maintained that the charges in the company's hotels were excessive, compared with those of other hotels. The loss of £395,000 on "collection and delivery" shown in Account No. 16 was a very large amount. The number of lorries running empty might be reduced. He noticed that the amount of savings bank deposits had increased by £1,225,896, which indicated that the employees were not badly off.

Mr. Harvey suggested that all consideration of a further

2½ per cent. to the staff be postponed until the ordinary stockholders had had 2½ per cent. given to them.

Mr. Gregg asked if the Statistical Department could ascertain the cost per ton-mile of making and maintaining an arterial road, compared with that of the railways, which the companies had to make for themselves. He believed the cost of making a first class road in Lancashire was from £20,000 to £35,000 a mile. The moment the surface had gone the whole road had to be remade from the base. The public wanted to know what all this traffic which was allowed to go freight free on the roads was costing the taxpayer. Regarding the Manchester and Wilmslow line which had now been opened, he thought, about 32 years, that was a case where the railway company should have electrified it at the outset, and not allowed the competitive road traffic to develop all that country. In the morning and evening the service was intense and good, but in the middle of the day the intervals were too long. He hoped something was going to be done about the Midland hotel at Manchester, which was one of the most paying hotels on the system, but was now getting on for 40 years old.

Mr. Leslie Boyce, M.P., congratulated the board on the position of the company and its prospects. Stockholders had been assured that the only test of the expenditure of the £9,000,000 which this company was to receive out of the 2½ per cent. guaranteed loan, was whether, after paying all interest and other charges in relation to it, the expenditure would result in either maintaining or increasing the net revenue of the company. In his view the proposed expenditure would be definitely to the advantage of the ordinary stockholders. It would cost the taxpayer nothing, and would create employment where it was very badly needed, besides affording a very welcome opportunity to the investing public to subscribe to the loan, otherwise they would not have subscribed so readily. At two of the company's hotels at which he was in the habit of staying it was necessary to book well in advance, and he could not see any advantage in reducing charges if the public were prepared to fill the hotels at present prices. He strongly deprecated any public discussion at this meeting on wages, which were now the subject matter of negotiations.

Mrs. Smith asked that more timetables should be put up in places other than stations. At one of the company's hotels she found that the smallest thing she could order was an egg—at 2s. 6d.

Commander Inglefield was glad that the Chairman had given publicity to the propaganda by the road interests and thought it was high time that road rates for freight were regulated. He would like stockholders to realise that the modest remuneration of £25,000 to the directors was a mere drop in the ocean compared with the £950,000 required to pay one per cent. on the ordinary stock. Mr. G. T. Plant inquired whether the Railway Finance Corporation, by virtue of the loan made by it, would intervene in the affairs of the company at all.

Mr. Walter Scott suggested that the Chairman might make some reference to the gallant conduct, on the previous day, of two men on the railway. Any expression of the thanks of this big meeting to these men would go a long way.

Mr. Hutchinson considered it was absolutely essential to have penny-a-mile tickets for both the single and the return fare. The difference between the ordinary railway fare and the bus fare was too marked. The great difference between classes in the present classification of goods traffic was causing the loss of a great deal of traffic to the road.

Mr. Perry asked whether the pooling arrangements were working smoothly and whether their further extension was being considered.

Mr. S. P. Butler considered that if the Government was expecting the railways to keep their systems in a state of efficiency for a national emergency it should give some consideration to the ordinary stockholders.

Chairman's Reply

The Chairman: Ladies and gentlemen, may I now answer some of the questions that have been put? I am very grateful to you for your various observations.

Mr. Wilson, of Accrington: We are very glad, of course, that the C.O.D. arrangements are meeting with your approval, and we hope, like you, that they will grow and become an increasing strength to the company. With regard to circular tickets, no doubt when there is any demand for a particular range, it can be more quickly satisfied than when it is a novelty. We cannot guarantee to be able to issue one off the roll for a particular whirligig that any particular traveller may suddenly invent, but you will find that the area in which that can be done will tend to increase. I think there is some misunderstanding in the figures about the agency. I make the total figure for these agency payments £88,000. That includes all the great agencies, Cook's and our agencies abroad, and all the agencies where commission is paid for tickets being sold and also those services for giving information about our line, and an attempt to get rid of that would cut off an enormous amount of important business. I want to see that figure go up because I assure you we get value for money.

Now, Mr. Wilson made various suggestions showing how 2½ per cent. on the ordinary stock could be paid immediately, but they were most of them, I think, outside the possibilities of this board. They were really matters for the Legislature and those who can alter the whole framework of the social life in which we live.

Mr. Macadam made a very pertinent suggestion about the Wharncliffe meeting, which I will certainly have taken into consideration. We will try it as an experiment, and see what happens.

Now with regard to the reconstitution of Euston—the hotels and the offices, and so on, we are hoping for very great operating improvements from that reconstruction. We are hoping with the immense possibilities at the terminal hotel which we are realising every day from the small capital improvements we have made in bringing the present one up to date that there are great possibilities of a remunerative undertaking there again. We are housing our staff under the most modern conditions in a really up-to-date building at Euston House, and the economies that arise from that indicate to us to some extent that the existence that we are leading in the rabbit warrens of a hundred years ago at the offices we now have, can be improved to the advantage of the stockholders also, and whether it is the station or the hotels or the offices, we look forward gladly to the time when we shall have that up-to-date structure and layout really equipped with modern conditions. It is suggested that this is not the time, but these things have no relation to the question of 1 per cent. dividend on the ordinary stock. This is a long-distance programme. Your board are perfectly clear that they are doing their duty to the shareholders in taking advantage of cheap money and making this important improvement in the arrangements for the London terminal.

Now I think Mr. Macadam was on some different figures from those that I can interpret with regard to road transport when he gave the figures he did. With regard to collection and delivery, it is a most integral part of our railway undertaking as a whole. It is only a bookkeeping division of figures. If you read it in with the rest of our figures, it is absolutely essential to our earning powers. I tried to show from the fact that the Germans and the Americans are coming over here to copy us that they are not misled by that particular item in the accounts.

Mr. Macadam would like two lists of hotels, one showing those that pay and the other those that do not pay. I think I can say with confidence that he can put on one list all the L.M.S. hotels that are making a profit, and on the other list he can put as big an "O" as he likes. Taking the hotels altogether, they not only pay but make a margin over and above the interest on the capital involved and, therefore, they not only become a hotel department but also help to support the rest. The dining cars also pay, and we are very glad that our competent Hotel and Dining Car Controller is able to show us year by year better results.

With regard to charges in hotels, as long as purses have different sizes and people have different tastes, there will always be differences of opinion. There are differences of opinion about hotels sometimes even among our own direc-

tors, but I can assure you that Mr. Leslie Boyce has put his finger upon the matter when he refers to net revenue and our desire to make the most of the Hotels Department for our shareholders. That does not mean that everywhere half a crown is charged for an egg or what goes with it. That I do not know, but I am going to make careful inquiry.

Then a very good point was made that we ought not in this open meeting at a time when negotiations are pending to make any kind of detailed examination of the situation with regard to wages. But that was a nice point that was made about the increase in the Savings Bank deposits, and I will hand that on to those of our officers who have to conduct these negotiations, and they shall point out how apparently prosperous, at any rate, the recipients of wages and salaries are, or the amount of money they are able to save in our Savings Bank which indeed we are very glad to have and which is very good money for the company.

Mr. Gregg asks a question about the statistics as to the cost of making and maintaining the road expressed as ton miles of goods carried, which is a very pertinent question and one constantly having our attention. We have many such figures. They vary of course, in different years for different roads, and I believe figures of that kind were very important in connection with the Salter Report. Mr. Gregg may be quite sure that our people will not lose sight of that very important new item in the controversy on the road and rail question. I am very glad to have his observations on the Manchester-Wilmslow line; we have a good deal of experience now with the analogous case of the Manchester-Altrincham line as to what will pay and what will not pay, and the question as to when a particular area is merging into the paying zone for electrification is constantly being examined by our officials. I assure him that that particular case shall receive our attention, and if there is the slightest chance of electrification paying you may be sure we shall put that project forward at once.

With regard to the Midland Manchester Hotel, five years ago we had some elaborate plans made for improving it and bringing it up to date. At that time things were very bad indeed, and Manchester particularly was in the doldrums, and our custom there was very low, but we are quite clear now what ought to be done and your board have recently examined and passed the plans of some very interesting reconstruction of the interior which will supply that very want to which he refers, and I hope before many months are out he will be able to enjoy all the amenities for which he so readily pays.

I am very grateful to Mr. Leslie Boyce for his comments, and we are very glad indeed to have his powerful championship particularly on the question of taking up the Government loan at the present rate of money.

Mrs. Smith would like to have timetables put up more often. Well, I will see that the department makes a particularly good survey of what ought to be done in that direction.

I am grateful to Commander Inglefield for his comments, but I think that no particular question has been asked by him.

The answer to the question about the Railway Finance Corporation is that they are a mere channel for the money; they have no voice whatever in the way it is spent. The only people we have to satisfy in the expenditure are the Treasury, that we are conforming with the original arrangements under which it was borrowed, and the Ministry of Transport for certain technical details in the way it is spent. So that Mr. Plant need not fear that we are coming under any new yoke in that regard.

I would be very pleased indeed to have the comments of this meeting, as voiced by one of your members, conveyed to those two men for whose gallant conduct yesterday we are so grateful.

Mr. Hutchinson referred particularly to the difficulties of the classification and to the fact that it enables road transport to come in at points in the classification which are particularly vulnerable. It is a problem which is with us every day, and the problem of the road agency, free to take anything it likes at rates based, so to speak, on costs standing side by side with a national century-old system of classification in the interests of industry as a whole, is constantly with us, and its reconciliation is not yet.

I was asked a question about pooling. We have the powers of pooling, and the process of applying it is continually going on. In many of the most important centres we are having common working for each other's benefit, and wherever that can be done we are finding, of course, the new places to do it with the experience that we derive from the old, and, generally speaking, he may be assured that the arrangements are being carried out, and are satisfactory.

Then I was asked: Is there any possibility of reducing operating costs? I am always telling my Vice-President and officers that they have got to do so, and we are always endeavouring to do so; but, of course, every fresh bit takes more getting than the last bit. You have only to consider how the habits of people have changed. Take the question of the smaller parcels that are now done up in retail trades as compared with 10 or 20 years ago. We are doing per ton of traffic carried two to three times the amount of work we did for that reason only, and there are many new factors entering into operating costs every year for us to cope with, but you may be quite sure that that is a matter which is constantly before the management.

Some question was raised about the empty vehicles in London. The rationalisation of London Transport between the great transport companies and the railway companies is also constantly before us, and considerable improvements are being made. We are reducing the number of our depots, and we are rationalising that traffic as far as we can. We could be very greatly helped if the traders were to assist us more than they do as to the time of collection. If everything is left to the last minute, then, of course, there must be great congestion, and vehicles that could be reasonably filled throughout the day find themselves empty a part of the time, and the load for them is not well distributed. Improvements are being made, and we hope that with our modern equipment of motors and methods of collection and terminal changes that also will be improved.

The resolution regarding the adoption of the report and accounts was put to the meeting and carried unanimously.

The Chairman then moved: "That final dividends for the year ended December 31 last be hereby declared (less income tax) as follows: £2 per cent. upon the four per cent. guaranteed stock. £2 per cent. upon the four per cent. preference stock. £2 10s. per cent. upon the five per cent. redeemable preference stock (1955), and a dividend for the year of £4 per cent. upon the four per cent. preference stock (1923)."

The Deputy Chairman (Mr. E. B. Fielden) seconded the resolution, which was carried unanimously.

On the motion of the Chairman, seconded by the Deputy Chairman, Sir William Guy Granet, G.B.E., Mr. William Lionel Hichens, Mr. James Whiteford Murray, Mr. George Reginald Thomas Taylor, and Sir Isaac Thomas Williams, were re-elected directors of the company.

On the motion of Mr. Stevens, seconded by Councillor Wilson, Sir Nicholas Edwin Waterhouse, K.B.E., was re-elected an auditor of the company.

Mr. Leslie Boyce proposed, and Commander Inglefield seconded, a vote of thanks to the directors for their services during the past year, which was carried with acclamation.

The proceedings were then brought to an end.

SPECIAL GENERAL MEETING

A special general meeting of the London Midland & Scottish Railway Company was held at Euston station on Wednesday, March 5, Sir Josiah C. Stamp, G.C.B., G.B.E., (Chairman of the company), presiding. The Secretary (Mr. O. Glynne Roberts), read the notice convening the meeting.

The Chairman: This meeting is held in accordance with the Standing Orders of Parliament to submit for your approval three Bills. The first is the London Midland & Scottish Railway Bill, promoted by this company. Its principal purpose is to authorise the company to borrow £9,000,000 from the Railway Finance Corporation Limited, and to increase the company's capital powers by that

amount for the purpose of affording collateral security for the repayment of the sum so borrowed, by the creation of 4 per cent. debenture stock. The Bill provides that when the company shall have repaid to the Finance Corporation the moneys borrowed from it the debenture stock so created shall be cancelled. The Bill further provides that prior to or after such repayment, for the purpose of providing moneys therefor the company may create stock of any denomination to produce an amount equivalent to the nominal amount of the debenture stock so released. The directors will not be able to proceed to the issue of any such new stock unless they have obtained a resolution from the proprietors authorising its creation. The Bill will also authorise the company to acquire lands in various parts of the system, and to make archways under certain highways in the City of Coventry which are required in connection with a scheme for improving Coventry station. Powers are also included to carry out alterations to highways and the stopping up of other highways in connection with the scheme for extension and improvement of the Euston terminus. Another provision will sanction certain extensions to bridges at Manchester in order to enable the company to provide a new turn-table near London Road station. There is also a provision extending the time for the completion of certain works and the acquisition of certain lands which have already been authorised subject to a time limit by Parliament.

The second Bill is the London Passenger Transport Board Bill, promoted by that Board. The reason it requires your approval is that it contains a clause enabling this company to enter into an agreement with the London Passenger Transport Board in respect of a joint station which is contemplated at Mile End on the Whitechapel & Bow Railway.

The third is the Southern Railway Bill. This Bill is submitted for your approval because it contains powers relating to the Somerset & Dorset Railway. The powers are to abandon and fill in a small portion of the Glastonbury Navigation in the urban district of Burnham-on-Sea and to reconstruct a road which is now carried by a bridge by forming a solid embankment.

The three Bills were approved.

BELFAST & COUNTY DOWN RAILWAY COMPANY

The ordinary general meeting of the Belfast & County Down Railway Company was held at Queen's Quay station, Belfast, on Thursday, February 27, Mr. Thomas Richardson, D.L. (Chairman of the company), presiding.

The Chairman, in moving the adoption of the report and accounts, said that the only really outstanding feature during the past year was the coming into operation of the Road and Railway Transport Act (Northern Ireland). In pursuance of the powers thereby conferred on the Northern Ireland Transport Board, the road services both for passengers and goods of all the Northern Ireland railways were taken over by the Board on October 1 last, and consequently the figures in respect of this company's road undertakings were for nine months of 1935 only. Gross receipts from all sources for 1935 were £204,041, a reduction of £2,306 as compared with the previous year, which was partially attributable to the loss of receipts from road services for the last three months of the year. Total expenditure, at £188,248, showed a decrease of £1,893, a proportion of which was attributable to the saving of the cost of working the road services from October 1 to December 31. Net income worked out at £15,792, which was £414 less than in 1934, but after bringing in the balance of £1,692 carried from that year (which was £642 more than in the corresponding period), and deducting fixed charges and the interest on debenture stock, as well as the dividend on the 4½ per cent. "A" preference stock for the second half of the year they were left with a balance of £1,877, which it was proposed to carry forward.

Gross receipts from railway working were only £888 more than in the preceding year, a disappointing result in view of the improved conditions of trade, shipbuilding, and agriculture, and also in view of the greatly increased earnings of other railways both in Great Britain and Ireland. The obvious reason for this was the shortness of the line, which rendered it vulnerable from end to end to the many advantages of road motor competition which was in a position to carry traffic practically from door to door. This was more abundantly evidenced by the increasing success of their road motor services, as the accounts showed that for the nine months of last year the net receipts from the buses were £1,163 more than for the full twelve months of the previous year and from the motor goods services £233 more than in 1934.

The principal features of last year's passenger traffic were small increases in both numbers and receipts from first class passengers and a moderate decrease in second class. Third class passengers, however, showed a gratifying increase of nearly 29,000 in numbers and £661 in receipts. Workmen's tickets showed an increase of more than 56,000 in numbers and over £1,000 in cash. Second and third class season ticket traffic did not show much variation, but in first class there was a reduction of about 10 per cent. in both numbers and receipts, attributable to the more general use of private motorcars. Exclusive of season ticket holders the railway carried during the year nearly 3,000,000 passengers, or 82,000 more than in 1934, and earned £1,649 more money, the average fare being practically only 6½d. per passenger. Goods train traffic continued to shrink in a very disappointing manner. They carried 3,560, or about 4 per cent., less tons than in 1934, and took £222 less in receipts. Live stock traffic increased in numbers by over 12,000, but receipts were £164 lower.

Notwithstanding the continued application of the strictest economy in all departments, expenditure on railway working amounted to £155,169, an increase of £2,984, or a little under 2 per cent. The increase was mainly due to the spending of nearly £1,000 in excess of 1934 on maintenance of way and works and about £2,000 more on rolling stock caused by more extensive reupholstering and repair of carriages and the provision of ten new goods wagons as replacements of worn-out stock. The hotel and refreshment rooms department showed a profit of £4,882, or £355 more than in the previous year.

Regarding the probable effect which the operation of the Road and Railway Transport Act would have upon the fortunes of the railway, he considered that provided the transport undertaking were efficiently and economically conducted, and that overhead costs were kept within reasonable limits, the prospects of this company should be more favourable than for some years past, as a result of the unification of the transport interests. The consideration for the acquisition of this company's road services, together with good will, and garages at Holywood and Bangor was £18,792, and in satisfaction of this the company had recently received allotment letters for £8,972 A1 stock and £10,000 B stock of the Northern Ireland Road Transport Board.

The capital account had been credited with £2,500 for the sale of the Dufferin stoneyard adjoining the locomotive and carriage shops, and there was a charge to capital account of £251 for the conversion of two railway carriages into holiday caravans. A new diesel-electric locomotive had been ordered from Harland & Wolff Limited for use on the Downpatrick and Ardglass branch. It was similar in type to, but more powerful than, the locomotive obtained from the same firm in July, 1933, which had been operating on the Ballynahinch branch with quite satisfactory results, and had effected a considerable saving in cost of working as compared with a steam locomotive.

The company's application for the continuance during the year commencing March 1, 1936, of the 10 per cent. reduction in salaries and wages of the employees, was heard in Dublin by the Irish Railway Wages Board, and in accordance with expectation was duly granted.

The report was adopted.

Railway Speeds in 1935

3. Germany

By CECIL J. ALLEN, M.Inst.T.

In the year 1931, the timetables of the German State Railway disclosed but one single run timed at over 58 m.p.h. from start-to-stop, and that was over the short distance of 30·1 miles from Breslau to Königszelt. Four years later, after four almost complete transformations of the main line train services, in four successive years, the number of runs timed at this speed and over has increased to 157 daily, 91 of which are at 60 m.p.h. and over, 46 at 66 m.p.h. and over, and 29 at 70 m.p.h. and over. For the first time in railway history, schedules at over 80 m.p.h. from start to stop figure in railway timetables, four such runs being performed daily over German metals. In the highest ranges of speed, with 2,287 miles booked at over 70 m.p.h. from start to stop, Germany takes the lead over all other countries in the world; 6,676 miles at 60 m.p.h. and over, and 10,997 miles at 58 m.p.h. and over, are also remarkable figures, in view of the rapidity with which this speed revolution has been brought about, and particularly when the complexity of the German railway system, with its numerous lateral main lines and multiplicity of connections, all of which are affected by main line timetable reorganisation, is duly borne in mind. In Table A it will be noted that the thirty fastest start-to-stop runs in Germany are made without exception by diesel railcar units. This list is headed by the thirteen fastest railway runs in the world, four of which are timed at over 80 m.p.h. from start to stop. The fact that twenty-seven of these German runs are scheduled at higher speeds than the fastest run made by steam power in this country —the quickest German diesel run, at 82·3 m.p.h., has a lead of more than 10 m.p.h. over the fastest British run, which is booked at 71·4 m.p.h.—in itself suggests that in the realm of pure speed, apart from any other considerations, steam propulsion has been outstripped by diesel power. The German high speed diesel services at present number six, each of which makes a double journey daily. This number includes the Berlin-Breslau-Gleiwitz-Beuthen service, which, if not actually in operation at the time of writing, is expected to start very shortly. Unlike the other high speed railcar services, which are second-class only, with the special "FD" supplement, the Berlin-Beuthen car admits third as well as second-class passengers, and is classed as "D" only. The railcar services, of which five radiate from Berlin, while the remaining one travels across country from Cologne to Hamburg and back, are as set out in Table B.

The most notable railcar performance is that of the Fliegende Kölner, which covers a total of 719 miles daily at an average speed of 71·2 m.p.h., inclusive of eleven intermediate stops. Actually the entire distance covered each day is 730 miles, as this unit runs through Berlin to and from the Schlesischer Bahnhof, calling *en route* at Friedrichstrasse and, in view of the slow running necessary through the heart of the city, 22 min. are spent over the 5·6 miles between arrival at Zoological Gardens and the termination of the eastbound journey, and 20 min. in the reverse direction. Similarly the Berlin-Breslau-Beuthen railcar, which covers 645·6 miles daily at 70·1 m.p.h.

TABLE A.—DAILY RUNS IN GERMANY BOOKED AT 60 M.P.H. AND OVER FROM START-TO-STOP—WINTER SERVICE, 1935–1936

Train No.	Time	From	To	Distance	Time	Speed
				Miles	Min.	M.p.h.
		Diesel Railcars				
FDt.16	19.21	Berlin (Zoo)	Hanover	157·8	115	82·3
FDt.571	10.30	Leipzig	Berlin (Anhalt)	102·2	76	80·7
FDt.551	12.02	Leipzig	Berlin (Anhalt)	102·2	76	80·7
Dt.46	8.11	Sagan	Güben	37·5	28	80·4
FDt.552	17.06	Berlin (Anhalt)	Leipzig	102·2	77	79·6
FDt.572	18.24	Berlin (Anhalt)	Leipzig	102·2	77	79·6
FDt.15	10.09	Hanover	Berlin (Zoo)	157·8	120	78·9
FDt.15	8.43	Hamm	Hanover	109·6	84	78·3
Dt.46	8.40	Güben	Frankfort-on-Oder	30·0	23	78·3
FDt.16	21.17	Hanover	Hamm	109·6	85	77·5
FDt.2	11.00	Berlin (Lehrter)	Hamburg	178·1	138	77·4
Dt.46	7.34	Liegnitz	Sagan	46·3	36	77·2
FDt.1	15.16	Hamburg	Berlin (Lehrter)	178·1	140	76·3
Dt.46	5.35	Gleiwitz	Oppeln	48·9	39	75·2
Dt.45	0.18	Oppeln	Gleiwitz	48·9	39	75·2
Dt.45	21.25	Frankfort-on-Oder	Güben	30·0	24	75·0
Dt.45	22.05	Sommerfeld	Liegnitz	66·9	54	74·3
FDt.38	19,54	Hamburg	Bremen	71·7	58	74·2
FDt.37	10.25	Bremen	Hamburg	71·7	58	74·2
Dt.45	23.36	Breslau	Oppeln	50·7	41	74·2
Dt.46	7.00	Breslau	Liegnitz	40·4	33	73·5
Dt.45	23.00	Liegnitz	Breslau	40·4	33	73·5
FDt.37	9.22	Osnabrück	Bremen	75·8	62	73·4
FDt.16	22.43	Hamm	Dortmund	19·4	16	72·8
Dt.46	6.15	Oppeln	Breslau	50·7	42	72·4
Dt.45	21.50	Güben	Sommerfeld	16·9	14	72·4
FDt.38	20.53	Bremen	Osnabrück	75·8	63	72·2
FDt.38	22.25	Münster	Wanne-Eickel	41·6	35	71·3
FDt.551	6.42	Munich	Nuremberg	123·3	105	70·5
FDt.552	21.56	Nuremberg	Munich	123·3	106	69·8
FDt.38	21.57	Osnabrück	Münster	31·1	27	69·1
FDt.15	8.25	Dortmund	Hamm	19·4	17	68·5
Dt.45	20.35	Berlin (Friedrichstrasse)	Frankfort-on-Oder	52·9	47	67·5
Dt.46	9.06	Frankfort-on-Oder	Berlin (Friedrichstrasse)	52·9	47	67·5
FDt.37	8.15	Wanne-Eickel	Münster	41·6	37	67·5
FDt.572	21.00	Erfurt	Frankfort-on-Main	166·8	149	67·2
FDt.37	8.53	Münster	Osnabrück	31·1	28	66·6
FDt.571	6.40	Frankfort-on-Main	Erfurt	166·8	151	66·0
FDt.572	20.13	Weissenfels	Erfurt	47·4	45	63·2
FDt.571	9.28	Weimar	Leipzig	59·3	58	61·4
FDt.15	8.03	Essen	Dortmund	21·3	21	60·9
		Electric Traction				
FDt.720	7.00	Munich	Augsburg	38·4	33	69·5*
FDt.722	12.00	Munich	Augsburg	38·4	33	69·5*
FDt.720	7.34	Augsburg	Ulm	52·5	46	68·5*
FDt.722	12.34	Augsburg	Ulm	52·5	46	68·5*
D.192	9.13	Breslau	Königszelt	30·1	27	66·9
FDt.721	18.04	Augsburg	Munich	38·4	35	65·8*
FDt.723	22.27	Augsburg	Munich	38·4	36	64·0*
FD.79	12.44	Augsburg	Nuremberg	85·2	80	63·9
FDt.721	17.13	Ulm	Augsburg	52·5	50	63·0*
FDt.723	21.36	Ulm	Augsburg	52·5	50	63·0*
D.191	17.24	Königszelt	Breslau	30·1	29	62·3
FD.80	16.21	Nuremberg	Augsburg	85·2	84	60·9
FD.79	12.05	Munich	Augsburg	38·4	38	60·6
		Steam Traction				
FD.24	18.05	Berlin (Lehrter)	Hamburg	178·1	155	68·9
FD.23	7.25	Hamburg	Berlin (Lehrter)	178·1	157	68·1
FD.80	10.50	Berlin (Anhalt)	Halle	100·4	91	66·2
FD.6	9.25	Berlin (Anhalt)	Leipzig	102·2	94	65·2
FD.79	18.01	Halle	Berlin (Anhalt)	100·4	93	64·8
FD.5	19.17	Leipzig	Berlin (Anhalt)	102·2	96	63·9
D.10	9.35	Berlin (Anhalt)	Leipzig	102·2	96	63·9
FD.22	18.40	Hanover	Hamm	109·6	103	63·8
FD.111	13.40	Hanover	Berlin (Zoo)	157·8	150	63·1
FD.21	15.28	Hanover	Berlin (Zoo)	157·8	151	62·7
D.1	12.59	Lehrte	Gardelegen	63·2	61	62·2
D.19	1.12	Bielefeld	Minden	28·0	27	62·2
FD.26	11.26	Hanover	Hamm	109·6	106	62·0
D.2	14.52	Firchau	Schneidemühl	44·4	43	62·0
D.32	9.24	Oppeln	Brieg	24·8	24	62·0
D.34	8.28	Güben	Frankfort-on-Oder	30·0	29	62·0
D.34	6.51	Liegnitz	Sagan	46·3	45	61·7
FD.25	20.47	Hanover	Berlin (Zoo)	157·8	154	61·5
D.44	15.57	Berlin (Anhalt)	Halle	100·4	98	61·5
D.179	5.24	Magdeburg	Brandenburg	50·1	49	61·3
D.106	19.04	Spandau	Rathenow	36·7	36	61·2
FD.22	15.58	Berlin (Zoo)	Hanover	157·8	155	61·1
D.92	22.10	Potsdam	Magdeburg	72·0	71	61·1
D.61	18.57	Dobrilugk-kirchhain	Berlin (Anhalt)	63·9	63	60·9
D.4	18.57	Firchau	Flatow	24·3	24	60·8
D.118	6.00	Breslau	Liegnitz	40·4	40	60·6
FD.25	18.47	Hamm	Hanover	109·6	109	60·3
D.6	0.06	Stendal	Hanover	93·4	93	60·3
D.9	18.56	Leipzig	Berlin (Anhalt)	102·2	102	60·1
(a)	4 runs	Brandenburg	Magdeburg	50·1	50	60·1
D.159	18.32	Hamburg	Ludwigslust	72·0	72	60·0
D.180	0.04	Potsdam	Magdeburg	72·0	72	60·0
(a)	2 runs	Landsberg	Küstrin-Neustadt	27·0	27	60·0

* Electric railcar service. (a) In both directions of running. (b) Both runs in same direction.

TABLE B.—DAILY DIESEL RAILCAR SERVICES IN GERMANY. WINTER, 1935–1936

Train No.	Route	Distance	Overall time	No. of stops	Overall speed
		Miles	H. M.		M.p.h.
FDt.16	*Berlin (Zoo)–Hanover–Düsseldorf–Cologne	353·5	4 57	5	72·6
FDt.15	Cologne–Düsseldorf–Hanover–Berlin (Zoo)* ..	359·5	5 09	6	69·8
Dt.46	Beuthen–Breslau–Frankfort (O.)–Berlin (Friedstr.)†	322·8	4 34	7	70·7
Dt.45	†Berlin (Friedstr.)–Frankfort (O.)–Breslau–Beuthen	322·8	4 39	7	69·4
FDt.2	Berlin (Lehrter)–Hamburg–Altona	182·1	2 37	2	69·6
FDt.1	Altona–Hamburg–Berlin (Lehrter)	182·1	2 38	2	69·2
FDt.572	Berlin (Anhalt)–Leipzig–Erfurt–Frankfort (M.) ..	341·5	5 05	3	67·2
FDt.571	Frankfort (M.)–Erfurt–Leipzig–Berlin (Anhalt) ..	341·5	5 06	3	67·0
FDt.552	Berlin (Anhalt)–Leipzig–Nuremberg–Munich ..	425·6	6 36	2	64·5
FDt.551	Munich–Nuremberg–Leipzig–Berlin (Anhalt) ..	425·6	6 36	2	64·5
FDt.38	Altona–Hamburg–Bremen–Cologne	283·5	4 28	8	63·5
FDt.37	Cologne–Bremen–Hamburg–Altona	283·5	4 36	8	61·6

* Runs through to and from Berlin (Schlesischer Bahnhof), calling at Friedrichstrasse; time taken 20 to 22 min., distance, 5·6 miles. † Runs through to and from Charlottenburg, calling at Berlin (Zoo); time taken, 19 min., distance, 4·5 miles.

overall average, including 14 intermediate stops—a remarkable achievement—runs from Friedrichstrasse through to Charlottenburg, calling at Zoo, and returns from Charlottenburg in the evening, calling again at Zoo; on this distance of 4·5 miles 19 min. is spent in each direction. This service passes through the Schlesischer Bahnhof without stopping.

The longest daily journey is that of the Berlin-Munich railcar, which covers in all 851 miles, but in view of the mountainous nature of the country traversed between Leipzig and Nuremberg, speed is restricted by reason of both gradients and curves, and the overall average in this case is only 64·5 m.p.h. The Berlin-Frankfort service similarly has its speed somewhat lowered by the hilly country through which it passes. The slowest of the railcar services is the cross-country service between Cologne, Hamburg and Altona, chiefly owing to the number of stops made in Westphalia, and also, in the northbound direction, by reason of the fact that it runs from Cologne to Dortmund coupled to the FDt15 service for Berlin, and has to wait at Dortmund the latter's departure; even so, the overall average of 61·6 m.p.h. northbound and 63·5 m.p.h. southbound gives a time roughly 1¾ hr. less than the best ordinary passenger service between Cologne and Altona.

Before the quickest steam-hauled express in Germany there come a couple of fast electric railcar runs over the electrified Stuttgart-Munich main line, made by two units which complete the journey of 148·9 miles between Munich and Stuttgart in both directions daily in 2 hr. 24 min. westbound and 2 hr. 32 min. eastbound, notwithstanding the extremely steep gradients through the mountains between Ulm and Stuttgart. Another fast electrically-hauled timing is from Breslau to Königszelt, on the electrified Breslau-Görlitz line, 30·1 miles in 27 min., at 66·9 m.p.h., and is of interest in that four years previously (1931), this run, then scheduled in 31 min. (58·2 m.p.h.) was the *only* run in the German timetables booked at more than 58 m.p.h. from start-to-stop. Pride of place, so far as concerns steam, is taken by the non-stop FD expresses between Berlin and Hamburg, the eastbound train, leaving Berlin (Lehrter) at 18.05, being booked at 68·9 m.p.h. start-to-stop. Such has been the development of other forms of motive power in Germany that this fast run takes 34th place on the list, and the corresponding run in the reverse direction, booked at 68·1 m.p.h., 38th place.

The greatest steam advance in Germany during the past two years has been in the timing of the "D" class express trains. Passengers by both "D" and "FD" trains pay a small express fare based on distance travelled, but "FD" trains do not carry third class passengers and are subject to an additional supplement of 2 or 3 Marks, according to length of journey, with the result that the "D" class trains are more heavily patronised, and are therefore in general considerably heavier than the "FD" services. Moreover the latter make more numerous stops than the "FD" trains, so that over long distances the "FD" supplement offers a material advantage in journey time. But from the point of view of locomotive performance, the "D" class services in general are the harder to work. Over all the main lines where full speed running is permitted, the "D" trains are now scheduled in most cases at start-to-stop speeds of 55 to 62 m.p.h., and there are hundreds of runs so timed, a lengthy succession of comparatively short journeys being common at such speeds as these, so that heavy demands are made on locomotive power, particularly in acceleration. The principal main lines so concerned are Berlin-Königsberg, Berlin-Hamburg, Berlin-Cologne (as far as Hamm), Berlin-Magdeburg, Berlin-Frankfort (as far as Halle), Berlin-Munich (as far as Leipzig, and from Nuremberg to Munich), and Berlin-Breslau-Beuthen.

As a typical example, No. D.15, from Berlin to Königsberg, through a region not hitherto associated with high speed, is booked over the 53·1 miles from the Schlesischer Bahnhof to Küstrin-Neustadt, 53·1 miles, at 59·0 m.p.h. from start-to-stop; from there over the 27·0 miles to Landsberg at 60·0, and again over the 36·7 miles on to Kreuz at 57·9, while the 36·3 miles from Kreuz to Schneidemühl are scheduled at 55·0 m.p.h. The next 122·9 miles to Marienberg, across the Polish Corridor, and nominally non-stop, include working stops for frontier and locomotive purposes, which bring the average down to 49·2 m.p.h. The haulage through Polish territory is provided by the Polish State Railways. But beyond, in East Prussia, the 18·0 miles from Marienberg to Elbing are covered in 19 min., at 56·8 m.p.h., and the final 71·7 miles from Elbing to Königsberg in 72 min., at 59·8 m.p.h. Thus the entire 365·7 miles from Berlin to Königsberg, including six stops and the frontier formalities and locomotive changes, are run at an inclusive average of 51·4 m.p.h. The most notable present-day "D" class schedule is that of No. D.10, covering the 102·2 miles from Berlin (Anhalt) to Leipzig in 96 min., at 63·9 m.p.h.; the best "FD" service, leaving 10 min. ahead of this express, is only 2 min. quicker.

Table C shows the aggregate mileage booked daily in Germany at speeds of 58 m.p.h. from start-to-stop and upwards. In the highest ranges of speed the diesel railcars have a handsome lead, which they retain down to 62 m.p.h. and over, but the increase in steam speed mileage between 62 and 60 m.p.h. suffices to leave diesel propulsion but slightly ahead at 60 m.p.h. and over. As will be seen, the major proportion of the diesel high speed mileage is booked at over 66 m.p.h., while even that at 70 m.p.h. and over is almost two-thirds of the entire daily mileage run by these cars. As regards electricity, high speed mileage in Germany is chiefly confined to the two special units which make a return journey daily between Munich and Stuttgart, but 633 miles at 60 m.p.h. and over, and 718 miles at 58 m.p.h. and over, are booked by electrically-operated trains. The steam mileage incorporated in this table, which roughly equals the diesel mileage at 60 m.p.h. and over, nearly doubles it at 58 m.p.h. and over. The total

TABLE C.—AGGREGATE MILEAGE OF RUNS BOOKED DAILY FROM START TO STOP IN GERMANY AT SPEEDS OF 58 M.P.H. AND OVER—WINTER, 1935–1936

	70 m.p.h. and over	68 m.p.h. and over	66 m.p.h. and over	64 m.p.h. and over	62 m.p.h. and over	60 m.p.h. and over	58 m.p.h. and over
	Miles	Miles	Miles	Miles	Miles	Miles	Miles
Steam ..	—	356 (2)	456 (3)	659 (5)	1,589 (16)	3,042 (37)	6,707 (97)
Diesel ..	2,287 (29)	2,462 (32)	2,973 (38)	2,973 (38)	3,020 (39)	3,101 (41)	3,572 (46)
Electric ..	—	182 (4)	212 (5)	289 (7)	509 (11)	633 (13)	718 (14)
Total ..	2,287 (29)	3,000 (38)	3,641 (46)	3,921 (50)	5,118 (66)	6,776 (91)	10,997 (157)

NOTE.—The figures in brackets in each column indicate number of runs making up each aggregate mileage.

mileage booked in Germany at 58 m.p.h. and over reaches the handsome figure of 10,997, made up of 157 runs in all.

In Table D the start-to-stop runs exceeding 100 miles in length are set out. The 200-mile mark is just reached by the Berlin-Munich express railcar service, but the corresponding run between Halle and Nuremberg of the daily "FD" steam-hauled express, over the same route from Grosskorbetha southwards, is not actually non-stop, as the steam locomotive has to stop for banking assistance up the heavy gradients south of Probstzella. The railcar, although non-stop, is considerably restricted in speed over this section, owing to curvature of the track, and the comparatively limited speed—58·9 m.p.h.—of the run is thereby explained. In excess of 150 miles, there are 24 steam runs and 8 diesel runs. The non-stop journey of the Orient Express in each direction between Stuttgart and Munich, 148·9 miles in length, is one of the longest regular non-stop runs in the world for which electricity is responsible, and the average speed of 52·6 m.p.h. is remarkably high in view of the exceptional severity of the gradients between Stuttgart and Ulm, as steep in parts as 1 in 40. The run of 122·9 miles between Schneidemühl and Marienburg, on the Berlin-Königsberg main line, crosses the Polish Corridor, and as previously explained includes stops for changing locomotives. In all, the table shows 62 runs exceeding 100 miles in length non-stop by steam power, 16 by diesel power, and 2 electrically hauled—a total of 80 daily.

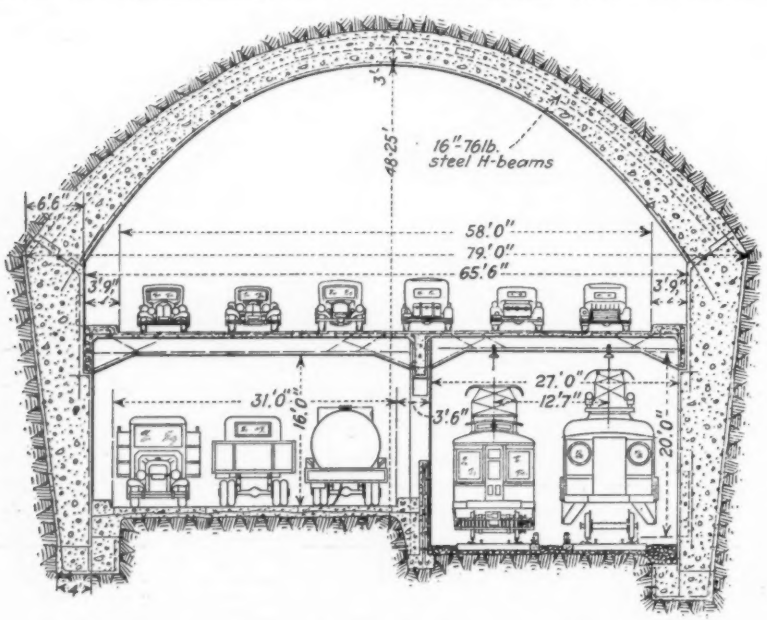
TABLE D.—DAILY NON-STOP RUNS IN GERMANY EXCEEDING 100 MILES—WINTER, 1935-1936

Between	Distance	No. of Runs Daily		Fastest Service		
		Diesel	Steam	Train	Time	Speed
	Miles				Min.	M.p.h.
Leipzig–Nuremberg	200·1	2	—	18·28 D	204	58·9*
Berlin (Lehrter)–Hamburg	178·1	2‖	2	11·00 D	138	77·4*
Munich–Wurzburg	172·0	—	6	9·20 W	183	56·4
Erfurt–Frankfort-on-Main	166·8	2	4	21·00 D	149	67·2*
Berlin (Zoo)–Hanover	157·8	2¶	8	19·21 D	115	82·3*
Charlottenburg–Hanover	156·5	—	4	11·20 D	162	58·0
Stuttgart–Munich	148·9	2†	—	6·11 W	170	52·6†
Munich–Nuremberg	123·3	2	—	6·42 U	105	70·5*
Cologne–Wiesbaden	115·0	—	2	2·40 N	144	47·8
Cologne–Mainz	114·5	—	2‡	11·50 S	128	53·7
Hamm–Hanover	109·6	2¶	6	8·43 U	84	78·3*
Cologne-Eltville	106·4	—	1	2·55 S	149	42·8
Hamburg-Lehrter	102·7	—	2	6·19W	112	55·1
Berlin (Anhalt)–Leipzig	102·2	4	15	10·30 U 12·02 U	76	80·7*
Baden-Baden–Basle (Bad. Bhf.)	102·0	—	2§	21·45 D	105	58·3
Berlin (Anhalt)–Halle	100·4	—	8	10·50 D	91	66·2

* Diesel railcar service. † Electrically-operated; the Orient Express. ‡ Rheingold Express.
§ Riviera Express. ‖ Fliegende Hamburger. ¶ Fliegende Kölner. D: Down (from Berlin).
U: Up (to Berlin). N: Northbound. S: Southbound. W: Westbound.

Double-deck Tunnel Construction

It will be remembered from our description of the San Francisco-Oakland Bay bridge in THE RAILWAY GAZETTE of May 25, 1934, that the alignment involves crossing Yerba Buena island in approximately the middle of the bay, and that the rocky heights of this island, rising to 350 ft. above sea level, necessitate a tunnel 540 ft. long. This tunnel has now been completed, and the height and width necessary for accommodating two levels of traffic, following the plan of the bridge itself, result in a work of record dimensions in some respects. The width of 79 ft. at the springing of the arch is greater than that of any other tunnel in the United States, and a comparative diagram in the *Engineering News Record* of the world's largest tunnels shows it to be surpassed only by the Rove canal tunnel near Marseilles. The height of 48 ft. 3 in. is just exceeded by the 50 ft. of the Boulder Dam diversion tunnels. An unusual feature of the construction was that the sidewalls and roof were built before the core was excavated. The upper deck was erected after these stages of construction were complete.



Cross section through tunnel under Yerba Buena heights showing the two decks and three levels for different classes of road and tramway traffic

It will be seen from the accompanying diagram that there is a 4-ft. difference between the level of the lorry roadway and the rail level of the inter-urban electric cars, in order to allow for the overhead collection equipment of the latter, so that the greatest height of the tunnel from floor to roof actually exceeds the 48 ft. 3 in. of the perpendicular from the floor to the highest point of the arch. The upper deck carries a roadway 58 ft. wide for six lines of fast motor traffic, and two 3-ft. 9-in. sidewalks. The lorry roadway is 31 ft. wide, for three lines of vehicles, and the double-track tramway tunnel is 27 ft. wide. The total excavation for the tunnel amounted to 75,175 cu. yd. The sidewalks required 10,148 cu. yd. of concrete, the roof 7,564 cu. yd., and the upper deck some 2,050 cu. yd.

IMPROVEMENTS AT BATHGATE JUNCTION, L.N.E.R.—The L.N.E.R. is rearranging the layout at Bathgate Junction yard, which handles goods traffic between Glasgow and other industrial centres in the west, the Bathgate district, and the East of Scotland. A loop line and siding are being extended, and additional connections will be provided between the main lines and the yard. The improvements will expedite the passage of traffic through the yard, and will speed up the running of a large number of goods trains between the places mentioned, serving an important industrial area.

Institution of Locomotive Engineers' Annual Dinner

The eighteenth annual dinner of the Institution of Locomotive Engineers was held on February 28, at the Trocadero Restaurant, London. This is the Silver Jubilee year of the foundation of the Institution, and there was a record attendance of 330 at the dinner, which, in the absence abroad of the President, Mr. A. C. Carr, was presided over by Mr. W. A. Agnew, until his recent retirement, Chief Mechanical Engineer (Railways), London Transport.

Those present included:

Messrs. W. A. Agnew; J. Alcock; J. Clubley Armstrong; S. L. Baister; J. H. Bance; D. S. Barrie; W. J. Bassett-Lowke; J. R. Bazin; Major H. P. M. Beames, T.D.; Capt. G. S. Bellamy; Messrs. A. F. Bound; G. V. O. Bulkeley, C.B.E.; O. V. S. Bulleid; M. Callahan; A. Campbell, LL.D.; J. Cave; H. Chambers; J. Clayton, M.B.E.; A. Cobb; Col. G. E. Cockburn; Mr. W. C. Cocksedge; Lt.-Col. F. R. Collins, D.S.O.; Messrs. G. Corrie; H. P. R. Coveney; C. E. Dee; J. L. Docker; J. P. A. Drewry; V. H. Drewry; R. J. Drury; W. S. Edwards; F. O. Ellis; C. E. Fairburn; E. L. Forge; B. D. Fox; W. S. Fraser, C.I.E.; W. Galloway; V. P. Gamon, J.P.; Commdr. H. V. Gaud, R.N. (ret.); Messrs. H. E. Geer; F. Gibbins; P. W. Gibbs; R. K. Glascodine, D.S.O., M.C.; R. T. Glascodine; F. G. Glover; W. S. Graff-Baker; Lt.-Col. E. Graham; Messrs. E. H. Greg; H. Gresham; J. H. Gresham; S. T. Gresham; H. N. Gresley, C.B.E.; R. Gresley; S. Groome; Brig.-Gen. F. D. Hammond, C.B.E., D.S.O.; Messrs. H. P. Harper; Ranald J. Harvey; C. A. F. Hastilow, M.Sc.; C. G. Hatherley; T. Hewitt; F. J. Hills; C. W. C. Hine; H. Holcroft; D. E. Holden; J. W. Holden; T. Hornbuckle; P. A. Hyde; A. C. Ilston; W. Jowett; W. Kelway-Bamber; A. J. D. Kitson; L. Kitson; F. J. Kuretschka; Chas. S. Lake; M. Lancrenon; J. J. Lawton; L. J. Le Clair; S. Loosen; Major R. G. MacIver, V.D.; Mr. W. G. P. Maclure; Brig.-Gen. Sir H. Osborne Mance, K.B.E., C.B., C.M.G., D.S.O.; Messrs. A. Meacock; J. C. Metcalfe; R. D. Metcalfe; G. E. Mills; A. E. Morgan; H. S. Morgan; Brig.-Gen. Magnus Mowatt, C.B.E.; Messrs. H. J. S. Moyses; J. Palmer; Lt.-Col. S. E. Parkhouse; Messrs. Loughnan St. L. Pendred; Frank Pick; F. D. Playford; Major F. A. Pope; Messrs. E. C. Poultney; R. A. Riddles; Capt. E. A. Robinson, M.C.; Messrs. M. D. Robinson; J. D. Rodgers; G. Rollason; C. R. Salmon; O. F. A. Sandberg; T. H. Sanders; Capt. M. K. F. Saunders, M.C.; Major E. I. Scott, M.C.; Messrs. F. Sedcole; W. J. Sedcole; G. H. Sheffield; H. G. Shortt; Major J. H. Smeddle, T.D.; Messrs. J. E. Spear; A. Spencer; B. Spencer; J. C. Spencer; J. W. Spiller; T. L. Squires; A. C. Stamer, C.B.E.; W. A. Stanier; Col. H. A. Stenning, T.D.; Messrs. G. F. Stevens; W. G. Tilling; Major C. F. Tofts; Mr. J. S. Tritton; Sir Seymour B. Tritton; Capt. Hugh Vivian; Messrs. W. L. Watson; F. S. Whalley, M.C.; Major Bruce G. White; Mr. F. E. Whitehouse; Major Charles Williams, C.B.E.; Mr. W. Cyril Williams; Major G. R. S. Wilson and Messrs. A. J. L. Winchester and F. R. Wix.

Major H. P. M. Beames, T.D., proposed the toast of "The Guests," in a characteristically jovial speech, in which he welcomed by name Mr. Frank Pick, Vice-Chairman, London Passenger Transport Board, whom he described as learned in the law and in commerce; Mr. H. N. Gresley, Chief Mechanical Engineer, L.N.E.R., who had done so much to prolong the life of the steam locomotive, and to whom he extended congratulations on his election as President of the Institution of Mechanical Engineers; M. Lancrenon, Chief Mechanical Engineer, Northern Railway of France; and Mr. Loughnan St. L. Pendred, Editor of *The Engineer*. Mr. H. N. Gresley, in reply, referred to the splendid locomotive work being done in M. Lancrenon's country, and stressed, too, the development made in locomotive engineering during the 25 years of the Institution's existence.

Mr. Frank Pick, proposing the toast of "The Institution of Locomotive Engineers," remarked that while he knew nothing of locomotives, he had thought a little of locomotion. First, he pointed out, it had created internationalism, which in politics might be admirable, but in the arts had made those of one country like those of another. Again, locomotion had carried about the world things of benefit and sometimes things less beneficial. Locomotion, further, had congealed large masses of the population and brought fresh problems, as, for example, when for the Royal Funeral the London Passenger Transport Board had had to deal with the unprecedented crowd of two million people, the technique of handling which large number had not yet been perfected. Then, again, locomotion had enabled the people to live further afield, until one could not tell country from town. Mr. Pick referred to the possibilities of locomotion in the future, and concluded with a tribute to the care and diligence with which Mr. Agnew had conducted his part of the affairs of the Underground and later London Transport during his term of office.

Mr. W. A. Agnew, in reply, read a message from the President, Mr. A. C. Carr, wishing success to the gathering, and also a similar message from Mr. Kitson Clark. He pointed out that the Institution covered all forms of locomotion on rails, and welcomed that evening some very old friends of his connected with electrical engineering and electric traction. He remarked also upon the very fitting selection of Mr. Gresley for the presidency of the Institution of Mechanical Engineers, a position originally occupied by George Stephenson himself. He welcomed their President-nominate, Mr. W. A. Stanier, and announced that this year's summer meeting had been fixed for May 22-June 1. He concluded by thanking Mr. Frank Pick for his personal tribute.

Mr. W. Cyril Williams expressed the thanks of those present to the Institution's Dinner Committee, and to its Secretary, Major H. A. Harrison, for the good work they had done to make the evening a success. Mr. J. Clayton suitably replied.

Sleeper Fastenings for Flat Bottom Rails

The "K" type rail fastening for flat bottom rails with steel sleepers, described in *The Railway Engineer* of April, 1933, has now given good results in trials extending over some two years, and is being adopted for considerable mileages both of new track and of relaying. In service, the "K" rail clip has fully substantiated the advantages claimed for it of positive gauge setting, perfect rail grip, resistance to creep, and ample provision for gauge widening on curves, combined with easy assembly and low initial cost. The movement between rail and sleeper, with consequent wear which has been experienced with the ordinary type of clip and bolt fastening, has been completely eliminated, while the advantage of the wedge action inherent in the key fastening has been retained by the sliding action of the overriding "K" clip, thus giving both vertical and horizontal grip to the rail flange.

As indicative of the extent to which railway administrations have appreciated the special qualities of the "K" clip, it may be remarked that in some instances special plant has been installed for pressing down the lugs of key and lug type steel sleepers as they are removed from the track due to the lugs tearing, and punching them to receive "K" clips. These fastenings are a patent of the Lancashire Steel Corporation Limited, Lancaster, and are manufactured in that firm's W.I.W. brand steel.

Whether "K" rail clips or the ordinary bolt and clip fitting are adopted for flat bottom rails and steel sleepers, the locknut is an essential part of the assembly. A pattern which is finding increasingly wide application, and is an important feature of the W.I.W. clip just described, is the Evertite patent locknut of Nuts and Bolts (Darlaston) Limited of Darlaston, which firm has recently supplied 700,000 ¾-in. Evertite locknuts to overseas railways. One half of this quantity was required for relaying some 40 miles of track of the Gold Coast Government Railways with "K" type rail clips. The remainder were for relaying a similar length of track on the Kenya & Uganda Railway with ordinary bolt and clip fastenings.

The Evertite locknut has many distinctive features, principal among them being that it is to all intents and purposes an ordinary standard nut, and can be used in exactly the same way as an ordinary nut. When the Evertite locknut is tightened down on to its bearing seat, it is positively locked, and will not become slack by vibration, no matter how severe. It has in consequence proved highly satisfactory on all forms of track fastenings, as well as in many other applications where a positive locknut is essential. Its price is cheaper than that of any other patent locknut on the market, and is very little dearer than an ordinary standard nut.

Retired Railway Officers' Society

Mr. G. G. Senior, O.B.E., J.P., C.C., M.Inst.T., who, as announced in our Personal columns this week, has just been elected President of the Retired Railway Officers' Society, took the chair at its half-yearly luncheon at the Abercorn Rooms on March 3. Among the large attendance of members and guests were the following:—

Messrs. A. W. Arthurton J. H. Bennett, J. D. Billington, J. F. Bradfield, W. E. Bradbury, Major Bradbury, A. J. Brickwell, F. S. Bond, W. G. Brown, R. Brown, S. Budge, W. J. Burcham, R. A. Carey, M.P., R. F. Castleman, J. G. Chesters, T. Christopher, Gordon Clear, E. A. Clear, M. Cooke, G. Cole Deacon P. D. Dowsett, H W. C. Drury, H. W. Ede, and A. Eddy; Sir George Etherton, O.B.E., D.L.; Messrs. H. Ferguson, J. F. Gee, F. Gilbert, W. Gracie, H. J. Guest, E. B. Hassall, G. Hughes, F. W. Jacobs, W. E. James, R. James, A. James, W. A. Jepson, S. F. Johnson, J. F. Johnson, J. A. Kay, K. Keer, J. W. Lovejoy, and D. McBullock; Dr. MacMahon, and Messrs. J. McLaren, P. D. Michod, A. S. Mills, L. A. Mohan, G. Morton, and Sir Joseph Nall, D.S.O., T.D., D.L., M.P.; also Messrs. C. H. Newton, A. Oldham, A. P. Parker, C. P. Parker, L. P. Parker, W. F. Pettigrew, J. Pike, A. Puleston, G. Reeves, C. A. Roberts, R. Roberts, E. Robinson, T. Ruffell, A. Rowbottom, T. W. Royle, J. E. Ryan, F. A. Sargent, E. C. Scott, F. H. Shipley, J. M. Smith, W. J. Smith, J. Procter Smith, J. Spooner, Gilbert Szlumper, M. C. Tait, A. Tarlow, W. A. Thomas, H. Thompson, F. W. Tyler, W. T. Venton, A. Walker, G. Walker, J. W. Waulkner, H. B. Webster, E. Wharton, G. H. Wheeler, A. Wilson, and W. Yates.

Among those who were unavoidably absent or had regretfully to decline invitations were:—

Sir James Milne, Sir D. Owen, Sir Felix Pole, Sir Herbert Walker, Sir A. Watson, Sir Ralph Wedgwood, and Messrs. J. Ballantine, Ashton Davies, H. N. Gresley, H. G. Humphreys, R. C. Irwin, E. J. H. Lemon, C. H. Newton, E. E. Painter, O. Glynne Roberts, H. E. Roberts, A. Winter Gray, H. L. Wilkinson, and H. V. Wood.

The Chairman, in proposing the toast "Our Guests," expressed a hearty welcome to them all, and especially to Col. Sir Joseph Nall, D.S.O., T.D., D.L., M.P., a distinguished soldier—having won the D.S.O. in France—a brilliant politician and business and transport man, Past President of the Institute of Transport and a Director of the Manchester Chamber of Commerce. After mentioning regrets from the absentees, he concluded by extending a hearty welcome to the guests once more.

Sir Joseph Nall, in reply, referred to the Government White Paper upon rearmament issued that day, and said that with so many retired railway officers looking hale and hearty, he expected they would all be on the reserve in case of trouble, as there was active scope for them in defence against air raids. On behalf of the guests, he thanked their hosts for their kind invitations and hospitality, and hoped the society would long flourish, and that he would have an opportunity of meeting its members again.

Sir George Etherton, O.B.E., D.L., proposed "Success to the Society," and said his earliest meetings with railway officers impressed him with their efficiency. Many years ago he met the late Sir William Forbes at Portsmouth and there learnt of his foresight in wishing to develop Langston Harbour, one of the finest in the country, and of his initiative with regard to electrification, both of which were now bearing fruit. Sir George then referred to his membership of the Assessment Authority, and the Lords' decision in favour of the Southern Railway. Turning to the Society, he said he looked to the president as an emblem of the society, and knew him as a man of never failing courtesy and high principles, reflecting those qualities of the society.

Mr. Gilbert Szlumper, in seconding the toast, said that though railways might not be mentioned in the Rearmament White Paper, they would do all that was required of them. As to Langston Harbour, it was to be the new base of Imperial Airways and had the advantages of being on the Southern Railway and close to the Air Force depot, and was in every way suitable. The Southern Railway also was continuing to follow Sir William Forbes' policy, and he hoped that the electrification to Portsmouth would be ready before the scheduled date. In conclusion he also hoped the Society would visit Southampton again and this time see the *Queen Mary*.

After Mr. Carey, M.P. for Eccles, had said a few appropriate words as one of the younger Members of the House, Mr. Alexander Wilson replied to the toast, on behalf of the society, welcoming the distinguished guests and thanking them for their kind remarks. Mr. E. Wharton then proposed the toast of "The President," which was seconded by Mr. E. B. Hassall, and enthusiastically endorsed by the gathering with musical honours.

L.N.E.R. (King's Cross) Literary Society Smoking Concert

On Friday last, February 28, the London & North Eastern Railway (King's Cross) Literary Society held, at the Queen's Hall, London, its 44th annual smoking concert. Mr. William Whitelaw, Chairman of the L.N.E.R., presided. As on former occasions, the programme was excellently planned, and provided a judicious blend of orchestral music (by the band of the Grenadier Guards), songs, and light entertainment. Among those present were:—

L.N.E.R.—Mr. William Whitelaw, Sir Charles Batho, and Messrs. C. K. Bird, C. J. Brown, R. Brown, P. J. Dowsett, B. P. Fletcher, O. C. Gatenby, W. M. Gracie, S. A. V. Gregory, A. J. Grinling, R. J. M. Inglis, J. Lees, F. Leigh, J. McLaren, C. H. Newton, H. S. Owen, W. J. Pepper, A. P. Ross, E. W. Rostern, J. E. Ryan, T. H. Seaton, C. J. Selway, F. C. C. Stanley, G. Sutcliffe, G. Sutherland, Percy Syder, J. C. L. Train, F. J. Trotter, and F. Warriner.

L.M.S.R.—Messrs. T. W. Royle, M. Taylor, W. K. Wallace, and W. V. Wood.

G.W.R.—Mr. R. Carpmael and Sir Ralph Cope.

S.R.—Messrs. C. Cooper, R. C. Davidson, A. Howie, A. E. Moore, and H. E. O. Wheeler.

L.P.T.B.—Messrs. A. L. Barber and A. R. Cooper.

Others.—Messrs. H. Dring (C.P.R.), H. W. Elliott (Pickfords Limited), E. I. Frosheug (Norwegian State Railways), G. H. Griffith (Pullman Car Company), E. L. Hawkins (late L.N.E.R.), H. J. Jewell (B. & N. Line), J. P. McClelland (C.N.R.), S. L. Murgatroyd (late L.N.E.R.), C. E. R. Sherrington (Railway Research Service), and J. Procter Smith (late L.N.E.R.).

Before presenting the cups and shields for the various competitions organised by the Society, Mr. William Whitelaw extended a hearty welcome to the friends and traders who were their guests. He said he did not know that he had any special message for them this year. He might, however, say—not, as in years gone by, send your traffic by the G.N.R. and not by the L.M.S.—but send your traffic by the most convenient railway, but for heaven's sake don't put it on the road! Mr. Whitelaw referred to the cover of the concert programme, on which was a sketch of the "drier side" of England; he noticed that Middlesbrough was omitted, but Grimsby included, and wondered (amidst laughter) if the artist expected Middlesbrough to wipe out Grimsby. Continuing his football references, he said that at 2.30 on Thursday next (yesterday) he hoped that 70,000 people would go to King's Cross to see the first of a new class of engine the L.N.E.R. was introducing; these locomotives were to be named after famous football clubs, and the first was to be called *Arsenal*.*

Mr. Whitelaw then presented the cups and shields to the winners of the various competitions, namely, the Billiards League Championship, Snooker Championship, Chess Section Championship, Inter-Departmental Billiards, and Inter-Departmental Snooker. Before the close of the concert, Mr. C. H. Newton, Divisional General Manager, Southern Area, L.N.E.R., proposed a hearty vote of thanks to the Chairman, which was carried with musical honours.

HALT AT ALL STRETTON.—The G.W.R. and L.M.S.R. opened on Saturday, February 29, a new halt at All Stretton, between Church Stretton and Leebotwood stations, on the Shrewsbury-Hereford joint line. Cheap bookings are available to surrounding places.

* The naming ceremony is briefly recorded in a news paragraph on page 487.

United Kingdom Railway Officers' and Servants' Association

Sir Murrough J. Wilson, K.B.E., presided at the 75th anniversary festival dinner of the United Kingdom Railway Officers' and Servants' Association at the Trocadero, London, on Wednesday last, March 4. Among those present were:—

Messrs. H. A. Alexander, K. M. Alexander, Col. Miles Backhouse, Mr. C. H. Barfoot, Lt.-Col. P. M. Brooke-Hitching, Messrs. H. C. R. Calver, R. Carpmael, E. Card, Sir Ralph Cope, Messrs. T. E. Chrimes, W. Enves, H. Foden-Pattinson, Lt.-Col. C. J. Francis, Messrs. R. B. Glassborow, A. Gregory, J. A. Kay, G. Keary (Treasurer of the Association), G. F. Lofting, the Hon. R. G. Lyttelton, Mr. D. W. P. Milbank, Major F. H. Millman, Messrs. A. E. Moore, G. Penney, Capt. Leonard Plugge, M.P., Messrs. J. W. Porter, T. Potter, John Reid, G. Rollings-Smith, J. S. Schreiber, Charles Sheath, G. Proctor Smith, Percy Syder, J. F. M. Taylor, F. W. Tipton, A. J. Trewren, F. Warriner, D. Denis Williams, and J. S. Wilson.

Sir Murrough Wilson, in proposing the toast of "Prosperity to the Association," said that to put it plainly his task was one of begging. He thought his position was like that of a man who was proposing to a widow. He knew everything he said had been said before by another man, and he also knew that the other man had said it very much better than he had. It was not, he thought, an occasion for long speeches, but for those who wished to make long speeches he would propose that a charge should be made on a proportional basis. Four minutes would be free, but after that payment per minute would have to be pretty strong. Turning to the organisation of the association's activities, Sir Murrough first expressed gratitude to Mr. F. C. Wilson for his work as Chairman of the Committee of Management. He then reminded the gathering that the association could not be expected to be actuarially sound. Subscriptions from members financed the payment of 106 annuities, sickness benefits, and grants to those who hoped to become annuitants. There was nothing left over from the members' subscriptions, however, for the maintenance of the association's organisation. It was this that those present at the festival financed.

Mr. F. C. Wilson, replying on behalf of the association, said that the death of the late King had affected the funds this year. The money raised that night, however, would help the association to continue to make grants to the necessitous cases brought to the attention of the committee. It was a proud boast that no deserving case had ever been turned down, irrespective of whether the application was from a member or not. He thanked Sir Murrough Wilson for his help and encouragement.

Mr. E. C. Cox, C.B.E., M.V.O., proposed the toast of "The Visitors." During the whole of his railway career he had been connected with the association, and he knew its value. They were particularly grateful to those who had been influential in bringing in generous contributions. He wished them long life that they might continue to give, and prosperity that they might continue to be generous.

Brig-Gen. F. D. Hammond, C.B.E., D.S.O., replying, said he appreciated the honour of responding to the toast of "The Visitors" on the occasion of the 75th anniversary festival. He suggested it should be called an emerald jubilee, the emerald, like the association, being ever-green. He would like to congratulate the railways on their results last year. Since the war the railways had been under the harrow, and during that period of adversity they had reached a pitch of efficiency never previously attained. They were that evening remembering the minor members of the staff who had rendered such great help in achieving that efficiency.

Sir Charles Batho, Bart., proposing the toast of "The Chairman," expressed the gratitude of the association for the efforts made on its behalf by Sir Murrough Wilson. Sir Murrough responded briefly.

During the evening Mr. James, the Secretary, announced that a total of £1,215 16s. had been collected, the President's list amounting to £578 2s. The total was up by £16 15s. on that of last year.

G.W.R. Superintendent of the Line's Dinner

Mr. H. L. Wilkinson (Superintendent of the Line) presided at the revival of the annual dinner and concert of the G.W.R. Superintendent of the Line's office staff on February 28, at the Strand Corner House, when a record gathering of upwards of 180 members of the present and past staff and their guests attended. The principal guests included:—

Mr. F. C. A. Coventry, Superintendent of Road Transport; Mr. C. T. Cox, Divisional Superintendent, Paddington; Mr. T. B. Cox, Assistant Accountant; Mr. C. R. Dashwood, Assistant General Manager; Mr. H. T. Forth, Assistant Accountant; Mr. J. A. Kay, Editor, THE RAILWAY GAZETTE; Mr. F. W. Lampitt, Commercial Assistant to Chief Goods Manager; Mr. J. F. Lean, Principal Assistant to the General Manager; Mr. H. F. W. Page, Signal and Telegraph Engineer; Mr. H. W. Payne, Principal Assistant to Chief Goods Manager; Mr. J. H. Parker, District Traffic Manager, Plymouth; Mr. A. S. Quartermaine, Assistant Chief Engineer; Mr. S. G. Rowe, Assistant Secretary; Mr. G. Stephens, Chief of Police; Mr. H. Wheeler, Assistant to the General Manager.

Mr. J. Dewar (Publicity Officer) in proposing the toast of "The Great Western Railway Company," intimated that the characteristic which had appealed to him was the spirit of paternal interest of everyone to help a comparatively newly joined recruit, and it was with a feeling of personal sincerity that he asked the company present to support the toast of the continued prosperity of the Great Western Railway Company.

Mr. C. R. Dashwood (Assistant General Manager), in response, congratulated the Superintendent of the Line and his staff on the resumption of their dinner which he hoped would continue to be an annual event. The fortunes and happiness of the whole staff were bound up with the Great Western Railway and all were proud to be associated with a company of such great traditions and a reputation standing high throughout the world. He wished the shareholders, the owners of the railway, every prosperity in the future.

Mr. F. R. Potter (Principal Assistant to the Superintendent of the Line) proposed the combined toast, "The Retired Staff and Visitors." There was a goodly number of retired members present and, whilst it was invidious to make distinctions, Mr. Potter felt that he must mention the name of Mr. W. C. Simpson, who was the "father" of the present assembly. To the visitors Mr. Potter extended a very hearty welcome. Responses were made by Mr. S. Elcombe on behalf of the retired staff and by Mr. A. S. Quartermaine on behalf of the visitors.

Mr. K. W. C. Grand (General Assistant to the Superintendent of the Line) proposed the toast of the Chairman, and of Mr. F. R. Potter, who had been responsible for arranging the excellent programme of entertainment. Suitable responses followed and the toast was acclaimed with musical honours.

During the evening Mr. Wilkinson took the opportunity of thanking the staff for their presence in such large numbers, and for their loyal and ready assistance during the past. He looked forward to a continuance of these gatherings in the future.

U.S.A. ARTICULATED LOCOMOTIVES.—The Northern Pacific Railway of America is contemplating placing orders for twelve 4-6-6-4 type roller bearing locomotives of the Mallet type, each engine to have a tractive power of 106,000 lb., a length overall of 127 ft. 1¼ in., and a height of 16 ft. 4 in. from rail. These large engines will each weigh in working order with tender, 457 long tons, and have a tender capacity of 27 tons of coal and 22,000 gallons of water. The Union Pacific Railroad has ordered from the American Locomotive Company, 15 locomotives of the same wheel arrangement for fast freight service on mountain grades. The engines will have four 22 in. by 32 in. cylinders, a total weight (engine only) of 243 long tons, a tractive effort of 100,000 lb., and twelve 5 ft. 9 in. coupled wheels. The tenders will carry 19,000 gallons of water and 22 tons of coal.

QUESTIONS IN PARLIAMENT

Stray Railway Trucks

Mr. Leckie on February 27 asked the Minister of Transport whether, in view of the number of railway accidents caused by stray railway trucks and coaches being left standing on the lines by the breaking of couplings, he would make inquiries into the American and Canadian system of strong head-lights being carried on the engines, thus enabling drivers to see any obstacle a long way off.

Mr. Hore-Belisha.—This question was dealt with in the final paragraph of my chief inspecting officer's report on the accident at King's Langley in June, 1935, from which the following is the relevant extract: My attention has been called to a suggestion that these collisions would have been prevented by the use of searchlights on the engines. Owing to curvature of the railway at the site, I think it very doubtful whether such equipment would have had even preventive effect; but, in any case, in main line operation in this country, it would not be desirable from a safety point of view. Apart from the well known inherent disadvantages of an intense beam of light, not only to the approaching driver but to the driver using it, steps are having to be taken today to safeguard the view of enginemen from interference by extraneous road light signals and by street and sign lighting."

Argentine Railways

Sir Cyril Cobb on March 2 asked the Secretary of State for Foreign Affairs whether the agreement of February 14 between the Argentine federal authorities and the railways provided that the suspended Transport Co-ordination Bill should be enacted as part of the relief of the burden imposed upon the Anglo-Argentine transport concerns; and, if no such arrangement was made, would he await the passing of the Transport Co-ordination Bill, which passed the Argentine lower house last autumn, before the renewal of any Anglo-Argentine trade agreement.

Captain Ramsay asked the Secretary of State for Foreign Affairs whether he could state the date upon which the Argentine Government proposed to present the Transport Co-ordination Bill to the Argentine Senate; and whether its provision would alleviate the principal grievances of the British-owned railway systems.

Viscount Cranborne (Parliamentary Under Secretary, Foreign Office), replying to both questions.—So far as I am aware, the agreement recently concluded between the Argentine authorities and the British railway companies, which is of a private character, did not deal with the enactment of the Transport Co-ordination Bill. As stated in this House on December 16, that Bill will come before the Senate when Congress reassembles. As regards the question of the renewal of the Anglo-Argentine Agreement of 1933, I have nothing to add to the reply returned by the President of the Board of Trade to a question put by the Member for South Croydon, on February 6.

Mr. Liddall also on March 2 asked the President of the Board of Trade whether he would arrange that acceptance of any impending Anglo-Argentine trade agreement should be conditional upon the abolition of ill-treatment of non-Argentine capital invested in the Anglo-Argentine railways.

Captain Wallace (Secretary, Overseas Trade Department) replied.—Representations have already been made to the Argentine Government on this subject. I can assure my hon. friend that the general treatment of British capital invested in Argentina will be borne in mind in any negotiations for a trade agreement.

Mr. Liddall on March 3 asked the President of the Board of Trade, whether he would state the extent to which reduction of the Argentine exchange tax on Anglo-Argentine railways had been nullified by the compulsory lowering of maize freights; and would he stipulate, when renewing the Roca agreement, that the import duty on Argentine beef should not be less than 2½d. a lb. until Anglo-Argentine railways were permitted to earn a reasonable dividend in return for their services to Argentina.

Dr. Burgin (Parliamentary Secretary, Board of Trade) replied.—The agreement between the British railway companies in the Argentine and the Argentine Government is a private one, and I am not in a position to make a statement as to its effect. As regards the second part of the question, I would refer my hon. friend to the reply which was given to him yesterday.

Sir N. Grattan-Doyle asked the Secretary of State for Foreign Affairs whether he would inform the Argentine Government that competitive governmen building of railways and unreproductive railway construction work, redundant staffing, and unremunerative freight rates imposed upon Anglo-Argentine concerns cancel much of the reduction in the exchange tax; and would he also notify the Argentine Government that restrictions of the rights of the Anglo-Argentine railways to earn dividends is causing dissatisfaction among British investors.

Viscount Cranborne (Parliamentary Under-Secretary, Foreign Office).—All these questions have already been, and will if necessary continue to be, the subject of representations to the Argentine Government.

PARLIAMENTARY NOTES

G.W.R. (Additional Powers) Bill

Application is being made to Parliament by the Great Western Railway Company for leave to introduce additional provisions into the company's Additional Powers Bill, which was read a second time in the House of Commons on February 13. The additional provisions relate to the construction of a swing-bridge in the City of Oxford; the widening of a bridge at Norton Fitzwarren and of Trenance viaduct; lengthening of bridges at Bishop's Lydeard near Taunton, and at South Hinksey near Abingdon; requisition of lands; and revival of powers and extension of time for the compulsory acquisition of lands required in connection with a deviation and widening near Porthcawl authorised by the company's Act of 1913.

London Transport Bill

In the House of Commons on Wednesday (March 4), on the motion for the second reading of the London Passenger Transport Board Bill, an amendment for the rejection of the measure was moved by Mr. Viant (Lab.—Willesden, W.) in order to call attention to the tram and omnibus services in his constituency.

Mr. Parker (Lab.—Romford), who seconded, urged the claims of Romford to better train services.

Mr. Hudson, Parliamentary Secretary to the Ministry of Transport, said the Minister had only powers of persuasion with the board in these matters, and that it was inevitable in a vast undertaking hitches should occur at the outset. There was machinery which local authorities could use for appeal. This Bill was going to improve considerably the travelling facilities in Romford and the London area generally.

Mr. R. C. Morrison (Lab.—Tottenham N.) asked the Parliamentary Secretary to represent to the board the desirability of giving an opportunity to M.P.'s in the London area to discuss traffic problems with their officials instead of bringing them before the House of Commons.

Mr. Hudson gave this undertaking, whereupon the amendment for rejection was withdrawn and the Bill was read a second time.

Progress of other Bills

The London & North Eastern Railway (General Powers) Bill and the Mersey Docks & Harbour Board Bill were read a second time in the House of Commons on March 4, and the Manchester Ship Canal Bill was read a second time in the House of Lords on the same day.

A Select Committee of the House of Commons, consisting of Sir Henry Cautley (Chairman), Lord Balneil, Mr. David Davies, and Sir Arnold Gridley, has been appointed to consider the following Bills: London Passenger Transport Board, London & North Eastern Railway (London Transport), Great Western Railway (Ealing & Shepherd's Bush Railway Extension). It will meet on Tuesday, March 24.

NOTES AND NEWS

Germany to Issue Travel Marks.—Visitors to Germany in future will use "travel marks" instead of the registered marks which have been a familiar feature of travel in Germany during the past few years. It is stated officially that the travel marks will operate in exactly the same way as the registered marks from the travellers' point of view.

Southern Railway Rating.—The House of Lords began on February 24 the hearing of appeals by the Westminster City Corporation and others from the decision of the Railway and Canal Commission on the question whether certain offices and properties at stations of the Southern Railway should be rated as part of the railway undertaking, or rated separately. The hearing has already lasted eight days.

Railway Wages.—A further conference between the railway general managers and the three railway trade unions has been arranged for March 10, in London. The claim of the unions for the abolition of the deduction of 2½ per cent. from all earnings and for the readjustment of certain conditions of service as determined by Decision No. 119 (dated March 5, 1931) of the National Wages Board, will again be discussed.

Fatal Accident on C.P.R.—On March 2, after having got a tender, which had been derailed by a snowslide near Revelstoke in the Rocky Mountains, back on to the rails, fifteen men of the gang were crushed to death between it and the locomotive when it unexpectedly ran back down the gradient. It is presumed that the men had no chance of escape owing to the sheer snowdrifts on each side of the track.

Chilean Floods Destroy Railway.—Messages from Iquique state that the great Pachica dam, which was under construction, has been destroyed by an avalanche of water, brought about by melting snows and heavy rains. Up to the present, no victims have been reported, but communication has been cut off, and the damage caused is estimated at several million pesos. Following the destruction of the dam, the water rushed in the direction of Tarapacá, washing out the railway line and uprooting telegraph and telephone posts, besides doing considerable damage to workmen's camps.

Road Association Merger.—Last week the Commercial Motor Users Association and the Associated Road Operators agreed on the principles of a complete merger of the two associations. Negotiations to this end were begun many months ago. The Commercial Motor Users Association was established in 1903, when industrial and public-service motor vehicles were in their infancy. The Associated Road Operators was formed early last year as the result of an amalgamation of the Road Haulage Association and the Motor Hirers' and Coach Services Association.

The Appledore-Bideford Bus Service.—The Southern National Omnibus Co. Ltd. (a Southern Railway associate) has acquired the Appledore-Bideford motor service, which for the past 17 years has been maintained by Hocking's Ensign Carriages, a business owned by Captain E. B. Hocking and his son, Mr. David Hocking, of Appledore, North Devon.

James Watt Bicentenary Service at Handsworth.—On Sunday last, March 1, a commemorative service for James Watt was held at Handsworth Parish Church, where Watt, Boulton, and Murdock are buried. The service was attended by the Lord Mayor and Town Clerk of Birmingham, and by representatives of the engineering institutions. Mr. James D. Gibson Watt represented the Watt family.

Southern Railway Electrification Extensions.—In addition to the authorised extensions of electrifications, as announced in our issue of November 8, 1935 (page 774), electrification of the short but important connecting line between Three Bridges and Horsham is also to be undertaken. Details of the progress of the Portsmouth electrification are given in our *Electric Railway Traction Supplement* which accompanies this issue.

L.M.S.R. Midland Hotel, Manchester, Modernisation.—A comprehensive scheme for the modernisation of the whole of the ground floor at the L.M.S.R. Midland Hotel, Manchester, is to be put in hand. This hotel was built 32 years ago, and although the upper floors have been kept up to date by the installation in all bedrooms of running hot and cold water, radiators, Post Office telephones, and new lighting, extensive alterations are necessary in order to bring the ground floor fully into accordance with the most modern tendencies.

Reduction in American Railway Fares.—A Reuters message from New York, dated February 28, states that the Interstate Commerce Commission has prescribed that the maximum railroad passenger fares shall be 2 cents a mile in coaches and 3 cents a mile in Pullman cars, with the Pullman surcharge eliminated. The order, which becomes effective on June 2, affects the entire country, with the exception of a few minor railways in the West. The decision, carried by 5 votes to 4, found that the present regular fares of 3·6 cents a mile for coaches and 3·6 cents (plus a surcharge) for Pullmans were unreasonable. As some of the Western and Southern railway companies have already established low experimental fares, the order affects particularly those railroads which, with the exception of Baltimore & Ohio, vigorously opposed any reduction on the contention that any such lowering of rates would seriously impair their revenue. The decision is regarded as a victory for the Baltimore & Ohio Railroad Company, which has consistently advocated such a move. The spokesman of Baltimore & Ohio expressed the opinion that the new rates were sufficiently competitive with those of buses to promise increased rail traffic.

G.W.R. Locomotive "Lloyd's" Renumbered.—When the nameplate of the G.W.R. engine which has been named *Lloyd's* was unveiled at Paddington station on February 17 (as recorded on page 356 of our February 21 issue) this locomotive was numbered A1. We now learn that the number has been changed to 100 A1 and that therefore it accords with the highest Lloyd's Register ship classification.

Two New G.W.R. Halts.—A new halt at Ingra Tor, between Burrator halt and King Tor halt, was opened on Monday last, March 2. This is on the Yelverton-Princetown Line and will open up a lovely part of Dartmoor for holidaymakers. Another G.W.R. halt, at Ketley Town, near Wellington, Shropshire, is being opened today, March 6. Most of the local services call at these halts, and cheap bookings are given to places in the surrounding districts.

Road Accidents.—The Ministry of Transport return for the week ended February 29 of persons killed or injured in road accidents is as follows. The figures in brackets are those for the corresponding period of last year :—

	Killed, including deaths resulting from previous accidents		Injured	
England ...	95	(87)	2,905	(2,938)
Wales	4	(6)	104	(122)
Scotland ...	13	(11)	257	(274)
	112	(104)	3,266	(3,334)

The total fatalities for the previous week were 107, as compared with 121 for the corresponding period of last year.

Mishap at Auchterarder, L.M.S.R.—A mishap which, unfortunately, occasioned fatal injuries to the driver, Mr. George Morris, of Crewe, occurred to the 7.30 p.m. express passenger train from London (Euston) to Aberdeen and Inverness while the train was near Auchterarder station, between Gleneagles and Perth, in the early hours of Thursday, February 27. The boiler of the locomotive, which was of the "Royal Scot" type, was penetrated by the inside connecting rod, which had broken, and the resultant escape of steam occasioned severe burns both to Driver Morris, who also sustained a fractured leg in falling from the engine, and to Fireman F. W. Davies. Before falling from the footplate, Driver Morris had applied the vacuum brake, and the train was brought to a stand without other personal injuries and without damage to the coaching stock. Both the injured men were taken to the Perth Infirmary where Morris subsequently succumbed to his injuries. Inquiries are being held into the cause of the accident by the Ministry of Transport and by the L.M.S.R. Speaking

at the annual general meeting of the L.M.S.R. on Friday last, Mr. Walter Scott, a shareholder, said: "I suggest you make some slight reference this morning to the gallant conduct, yesterday, of those two men on your railway. Any little expression of the thanks of this big meeting to those poor fellows would go such a long way and would induce other servants of the company to do likewise if there is a chance of anything like that happening again." The Chairman, Sir Josiah Stamp, replied: "I will be very pleased indeed to have the comments of this meeting, as voiced by one of your members, conveyed to those two men for whose gallant conduct yesterday we are so grateful."

Gloucester City Transport.—On April 1 the Bristol Tramways & Carriage Co. Ltd. (an associate of the G.W.R.) is taking over the management, working, and maintenance of the Gloucester City Corporation omnibus services. The agreement, which was confirmed on February 24 by the Gloucester City Council, by 23 votes to 6, provides for the company to take over the Corporation rolling stock; to rent the Corporation's Bristol Road depot at £525 per annum; and to make a fixed annual payment of £2,000 to the Corporation. The arrangement is to last for 21 years, and thereafter to continue from year to year. After provision for working costs, overheads, &c., the net balance remaining from the working of the city services will be divided equally between the Corporation and the company.

Locomotive Engineers Awards.—At the annual dinner of the Institution of Locomotive Engineers last Friday (reported on another page) Mr. W. A. Agnew, from the chair, announced the institution awards for the past year as follow: Frederick Harvey Trevithick Prize to Mr. J. R. Sedgfield, Associate Member, of the South American Centre, for his paper on "Machine Tooling Methods and Machine Shop Reorganisation" Gold Medal of the Institution to Dr. R. P. Wagner, Honorary Member, Berlin, for his paper on "High Speed and the Steam Locomotive"; Alfred Rosling Bennett Award to Mr. T. H. Sanders, Member, Leeds, for his paper on "The Evolution of Railway Vehicle Suspension." This award was made personally to Mr. Sanders amid applause.

New Polish Aerial Ropeway Opened.—The aerial ropeway from Kusnice, near Zakopane, the terminus of the Polish State Railways in the Tatra Mountains, 464 km. (288 miles) from Warsaw, has just been opened to traffic and serves the ski-ing district of Mount Kasprowy, which has an altitude of 1,988 m. (6,520 ft.). The line is in two sections, the first, 2,001 m. (6,563 ft.) long, from Kusnice, 1,014 m. (3,325 ft.), to Mystenickie Turnie, 1,354 m. (4,441 ft.). The second section, 2,290 m. (7,513 ft.) long, takes the passenger to the summit of the mountain. The cars, which are suspended from the wire ropes, carry 30 passengers and a conductor, and are built of light metal. The entire journey takes 20 minutes, including the change of cars at Mystenickie Turnie. The ropeway, which has been built by a Leipzig firm, is complete with the most up-to-date appliances and is expected to prove of great importance in developing the popularity of Zakopane as a holiday resort both in summer and winter.

Enforcement of Road Traffic Control in India.—As bearing upon our editorial note on page 430, it is significant that in *The Times* of March 5, Sir James Grigg, the Finance Member, replying to the debate on the Budget in the Indian Assembly on the previous day, is reported to have said:—

"that there was nothing inconsistent in having losses on the railways and yet a surplus on the general Budget reflecting general economic improvement. The railways were subject to motor competition almost unregulated and sometimes unfair, and unless the problem of co-ordination was solved by co-operation between the Centre and the Provinces the railways would never pay and the Provinces would never get any share of income tax."

From this speech it would seem that the Central Government is stiffening in its insistence upon adequate control of road transport, to the extent of making the share of income tax payable to the Provinces depend upon the railway revenues, which in turn are limited by road competition.

RAILWAY AND OTHER REPORTS

Liverpool Overhead Railway.—The report for the year 1935 shows that in the traffic receipts of £61,538 there was an improvement of £2,117 over 1934; and in the expenditure of £62,223 there was a saving of £834, so that the deficiency on working was reduced from £3,637 to £685. Miscellaneous receipts brought in £5,683 against £5,867, and total net income improved from £2,230 to £4,997. After allowing £6,755 for debenture interest, there is a deficit of £1,758, which, added to the debit balance of £12,740 brought forward from 1934, makes a total debit balance of £14,498 to be carried forward. The number of passengers carried has increased from 5,872,065 to 6,188,599.

Isle of Man Railway.—Receipts from all sources during the year 1935 amounted to £50,090, a decrease of £931 in comparison with 1934. Working expenses amounted to £37,838, and rates, taxes and other charges to £1,507, making total disbursements of £39,345, which were £90 higher than in 1934. Receipts from passengers were £33,290, from parcels, &c., and mails, £5,764, and from merchandise, minerals, &c., £9,997. The number of passengers was 790,435, and the quantity of merchandise and minerals conveyed was 43,172 tons. The directors recommend a dividend of 2 per cent. for the year on the ordinary share capital, leaving £2,890 to be carried forward.

East Kent Light Railways.—The report for 1935 shows railway receipts of £10,937, against £10,710 in 1934. Expenditure was reduced from £9,307 to £8,874, leaving net receipts £660 higher at £2,063. Adding miscellaneous receipts of £1,280, against £998, brings net revenue for the year to £3,343, an increase of £942. After adding £23 brought forward and deducting £800 tax written off, there remains £2,566. Debenture interest absorbs £2,539, leaving £27 to be carried forward.

Bengal Dooars Railway.—The approximate net earnings for the six months ended September 30, 1935, after allowing for Indian taxation, amounted to £18,365, which, together with £59,465 brought forward from March 31, 1935, £945 for interest and £68 for profit on exchange, makes a total of £78,843. From this amount must be deducted £7,200 for six months' dividend on the preference stock, leaving an available balance of £71,643. The board has declared an interim dividend of 3 per cent. on the ordinary stock on account of the year ending March 31, 1936, subject to United Kingdom income tax (less relief in respect of Dominion income tax), which will absorb £12,000, leaving £59,643 to be carried forward at September 30, 1935. Dividend warrants will be posted on March 25.

Vickers Limited.—The following final dividends for the half-year ended December 31, 1935, will be paid on March 27 to the holders of the preferred stock and preference shares of the company who were registered in the books of the company on February 29: 2½ per cent. on the preferred 5 per cent. stock (less income tax); 2½ per cent. on the 5 per cent. preference shares (less income tax); 2½ per cent. on the cumulative preference shares (free of income tax).

Londonderry & Lough Swilly Railway.—Gross receipts from railway working were £22,672 in 1935, against £24,747 in 1934, and railway expenditure was reduced from £29,138 to £26,434, leaving a loss on railway working of £3,762 compared with £4,391 in 1934. Passenger train receipts improved from £6,290 to £6,312, but goods train receipts fell from £17,528 to £15,578, the fall being chiefly under livestock. Road transport net receipts improved from £3,240 to £3,729, and there was a profit of £31 on steamboats against a loss of £37 in 1934. With the help of rents and a grant-in-aid of £1,638 from the Government of Northern Ireland, the total net income is raised from £911 to £2,113. The 1935 accounts do not show any payments for the Treasury moiety of the surpluses on the Cardonagh and Burtonport lines, in respect of

which £2,485 was paid in 1934, and there is a new credit of £6,411 for adjustment in respect of provisions for income tax and statutory charges raised in connection with extension lines no longer required. The debit balance to be carried forward is reduced from £6,566 to £2,972.

Lincoln Wagon & Engine Co. Ltd.—Net profits for the year ended February 1 show a fall from £45,179 in the preceding year to £33,505, but the decline is more than accounted for by the fact that the surplus on sale of investments included in the present accounts is only £2,578, against £15,589 a year ago. During the year £61,667, forming part of the reserve account, has been capitalised and applied in paying up an additional 1s. 4d. a share on each of the 925,000 ordinary £1 shares, making those shares 3s. a share paid. Two interim dividends, each of 5 per cent., have been paid on the shares as before the capital bonus, and it is proposed to pay a final dividend of 8½ per cent. on the larger capital. The amount absorbed in ordinary dividend for the year will then amount to £15,114, against £14,935 taken by the distribution for the preceding year, the rate of which totalled 20 per cent. After making transfers of £11,667 to reserve account and £3,000 to contingency account, the balance carried forward is £16,225. (See editorial note on page 430.)

Derwent Valley Light Railway.—Gross receipts from railway working in 1935 amounted to £7,433, against £6,987 in 1934, and expenditure increased from £5,488 to £5,544, leaving net receipts £390 higher, at £1,889. The net revenue improved from £1,988 to £2,333. After meeting debenture interest and appropriating £1,000 (against £500) to general reserve, the balance available is £1,096, which it is proposed to carry forward. The amount brought forward from 1934 was £1,428. Total tonnage amounted to 57,950 tons, as compared with 50,873 tons in 1934.

British and Irish Traffic Returns

GREAT BRITAIN	Totals for 9th Week			Totals to Date		
	1936	1935	Inc. or Dec.	1936	1935	Inc. or Dec.
L.M.S.R. (6,919½ mls.)	£	£	£	£	£	£
Passenger-train traffic...	385,000	380,000	+ 5,000	3,286,000	3,271,000	+ 15,000
Merchandise, &c. ...	466,000	436,000	+ 30,000	4,025,000	3,916,000	+ 109,000
Coal and coke ...	276,000	259,000	+ 17,000	2,571,000	2,403,000	+ 168,000
Goods-train traffic ...	742,000	695,000	+ 47,000	6,596,000	6,319,000	+ 277,000
Total receipts	1,127,000	1,075,000	+ 52,000	9,882,000	9,590,000	+ 292,000
L.N.E.R. (6,336 mls.)						
Passenger-train traffic...	257,000	259,000	— 2,000	2,212,000	2,212,000	—
Merchandise, &c. ...	330,000	315,000	+ 15,000	2,813,000	2,750,000	+ 63,000
Coal and coke ...	257,000	224,000	+ 33,000	2,365,000	2,194,000	+ 171,000
Goods-train traffic ...	587,000	539,000	+ 48,000	5,178,000	4,944,000	+ 234,000
Total receipts	844,000	798,000	+ 46,000	7,390,000	7,156,000	+ 234,000
G.W.R. (3,746½ mls.)						
Passenger-train traffic...	154,000	157,000	— 3,000	1,386,000	1,383,000	+ 3,000
Merchandise, &c. ...	190,000	175,000	+ 15,000	1,608,000	1,574,000	+ 34,000
Coal and coke ...	111,000	102,000	+ 9,000	1,041,000	980,000	+ 61,000
Goods-train traffic ...	301,000	277,000	+ 24,000	2,649,000	2,554,000	+ 95,000
Total receipts	455,000	434,000	+ 21,000	4,035,000	3,937,000	+ 98,000
S.R. (2,154 mls.)						
Passenger-train traffic...	243,000	237,000	+ 6,000	2,142,000	2,102,000	+ 40,000
Merchandise, &c. ...	66,000	63,000	+ 3,000	503,500	517,000	— 13,500
Coal and coke ...	44,000	36,000	+ 8,000	351,500	319,000	+ 32,500
Goods-train traffic ...	110,000	99,000	+ 11,000	855,000	836,000	+ 19,000
Total receipts	353,000	336,000	+ 17,000	2,997,000	2,938,000	+ 59,000
Liverpool Overhead ... (6½ mls.)	1,064	1,052	+ 12	10,294	9,854	+ 440
Mersey (4½ mls.) ...	4,055	4,038	+ 17	37,842	37,203	+ 639
*London Passenger Transport Board ...	539,000	530,800	+ 8,200	18,989,100	18,661,100	+ 328,000
IRELAND						
Belfast & C.D. pass. (80 mls.)	1,591	1,572	+ 19	15,262	15,496	— 234
,, ,, goods	568	500	+ 68	4,303	4,044	+ 259
,, ,, total	2,159	2,072	+ 87	19,565	19,540	+ 25
†Great Northern pass. (543 mls.)	7,750	8,200	— 450	60,750	58,300	+ 2,450
,, ,, goods	10,250	9,750	+ 500	75,400	71,750	+ 3,650
,, ,, total	18,000	17,950	+ 50	136,150	130,050	+ 6,100
†Great Southern pass. (2,076 mls.)	28,724	27,494	+ 1,230	213,164	204,530	+ 8,634
,, ,, goods	38,683	36,094	+ 2,589	324,659	327,664	— 3,005
,, ,, total	67,407	63,588	+ 3,819	537,823	532,194	+ 5,629

* 35th week, the receipts for which include those undertakings not absorbed by the L.P.T.B. in the corresponding period last year; last year's figures are, however, adjusted for comparative purposes
† 8th week

British and Irish Railways Stocks and Shares

Stocks	Highest 1935	Lowest 1935	Prices Mar. 4, 1936	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	55½	44½	49½	+3½
5% Con. Prefce. ...	124	108	120½	—
5% Red. Pref. (1950)	117	106¾	108½	—
4% Deb.	118½	108	115½	—
4¼% Deb. ...	122	110	117½	—
4½% Deb. ...	129½	118	127½	—
5% Deb.	140¼	130	140½	—
2½% Deb.... ...	82¼	68½	77	—
5% Rt. Charge ...	137	128	134½	—
5% Cons. Guar. ...	136¾	120½	132½	—
L.M.S.R.				
Ord.	25 5/16	16	22½	+2½
4% Prefce. (1923)	58¼	43½	66½	+2½
4% Prefce. ...	87½	73½	84	—
5% Red. Pref. (1955)	107	97¾	105½	—
4% Deb.	110¼	99½	107	—
5% Red. Deb. (1952)	119 11/16	111 5/16	118½	—
4% Guar.... ...	105⅝	95½	103	—
L.N.E.R.				
5% Pref. Ord. ...	15⅞	8¼	10½	+1
Def. Ord.	7 9/16	4¾	5¾	+½
4% First Prefce....	74¾	48	65*	−½
4% Second Prefce.	31⅜	16¼	24½	+2
5% Red. Pref. (1955)	92¼	71	86½*	−1
4% First Guar. ...	103 11/16	93	101	−½
4% Second Guar.	98¾	82½	93½	−½
3% Deb.	86	75	81	—
4% Deb.	109¼	98½	106½	+½
5% Red. Deb. (1947)	118½	106½	115½	—
4½% Sinking Fund Red. Deb.	112½	108	110	—
SOUTHERN				
Pref. Ord.... ...	87½	69⅜	91	+2
Def. Ord. ...	25 13/16	16¾	24	+3
5% Prefce. ...	124	108¼	120½	—
5% Red. Pref. (1964)	117¾	109½	116½	—
5% Guar. Prefce.	136½	121½	132½	—
5% Red. Guar. Pref. (1957)	121¼	112½	116½	—
4% Deb.	116¾	107	115	—
5% Deb.	138	130¼	138½	+1
4% Red. Deb. 1962–67	115	106½	115½	—
BELFAST & C.D.				
Ord.	9	4	9	—
FORTH BRIDGE				
4% Deb.	111¼	104½	104½	—
4% Guar.... ...	109⅞	104	104½	—
G. NORTHERN (IRELAND)				
Ord.	20	7	16¼	−¼
G. SOUTHERN (IRELAND)				
Ord.	57½	14½	45½	—
Prefce.	50	25¼	50	+2
Guar.	88¾	51¼	92¼	—
Deb.	86¼	70	88½	—
L.P.T.B.				
4½% "A" ...	130	119¾	125½	−1
5% "A" ...	139¾	130	136½	—
4½% "T.F.A." ...	113¾	108	110	—
5% "B"	131½	122¾	128½	−1
"C"	109½	91	106	—
MERSEY				
Ord.	23⅛	9¼	26½	+1
4% Perp. Deb. ...	100½	93½	97½	—
3% Perp. Deb. ...	75½	67	76	—
3% Perp. Prefce.	62	47¼	64½	—

* ex dividend

CONTRACTS AND TENDERS

The Cleveland Bridge & Engineering Co. Ltd. has received an order from the Peruvian Corporation for steelwork required for the reconstruction of Verrugus bridge.

Locomotive Boilers for Ceylon

Nasmyth, Wilson & Co. Ltd. has received an order from the Crown Agents for the Colonies for two locomotive boilers for the Ceylon Government Railways.

Charles Roberts & Co. Ltd. has received an order from Imperial Chemical Industries for 84 40-ton steel hopper-bottomed wagons.

Speed Recorders for L.N.E.R.

The Hasler Telegraph Works has received orders for Teloc speed indicators and recorders for the four new L.N.E.R. P2 " Cock o' the North " class locomotives under construction, following the successful use of the Teloc instruments fitted on the two earlier engines of this class in 1934.

Southern Railway Electrification

Pritchett & Gold and E.P.S. Co. Ltd. has received the contract from the Southern Railway for emergency lighting batteries for the new rolling stock now being built for the main line electric services between London and Portsmouth, which are to be inaugurated next year. The contract comprises 96 Nife alkaline batteries capable of carrying the full lighting load of the trains for half an hour, and they will be identical with the batteries which are in service on the Brighton and Eastbourne electrified sections of the line.

The Bengal-Nagpur Railway Administration has placed the following orders :

Tees Side Bridge & Engineering Co. Ltd., 720 carriage and wagon drawbars.

J. Baker, Bessemer & Co. Ltd., 1,500 carriage and wagon tyres.

Steel Company of Scotland, 1,500 carriage and wagon tyres.

Taylor Bros. & Co. Ltd., 250 disc-centred carriage and wagon wheels.

Brown Bayley's Steel Works Limited, 400 steel carriage and wagon axles.

The Hellenic State Railways have given a £250,000 order for rolling stock and improvement works to German railway engineering concerns, states an Exchange message.

W. G. Bagnall Limited has received an order from the Midland Railway of Uruguay for five boilers and five sets of cylinders for conversion of existing locomotives to superheated type.

R. W. Erbert Limited, on behalf of Dusseldorfer Eisenhuettengesellschaft, and to the inspection of Messrs. Rendel, Palmer & Tritton, has received an order for 525,820 dogspikes required for the Bengal North Western Railway.

The Bulgarian Ministry of Finance has granted a large credit to the State Railway Wagon Works to facilitate the production of railway wagons.

Railbus for South America

D. Wickham & Co. Ltd. has received an order from the Peruvian Corporation for one 40-seater petrol-driven railbus. This is a repeat order following immediately on the successful trials of the railbus just completed by D. Wickham & Co. for the same railway.

Leyland Motors Limited has received the following orders from railway and railway-associated road transport operators :

Wilts & Dorset Motor Services Limited : two oil-engined Titan passenger vehicles.

North Western Road Car Co. Ltd. : three oil-engined Tiger passenger vehicles.

Ribble Motor Services Limited : 10 Lion passenger vehicles (six oil engined).

Southdown Motor Services Limited : five Cub passenger vehicles.

Northern Ireland Road Transport Board : four oil-engined Beaver-Six goods vehicles.

New Zealand Government Railways : one Cub goods vehicle.

South African Railways and Harbours Board : four Terrier goods vehicles.

Mr. Travis Smith, of Matheson & Co. Ltd., which represents many British engineering firms in China, left London yesterday on a business visit to China and is expected to be away about four months.

The Indian Stores Department is calling for tenders, to be presented in New Delhi by April 4, for the supply of an axlebox bearing-brass boring machine.

Locomotive Boilers Required in India

The Controller of Stores, G.I.P. Railway, Bombay, is calling for tenders, to be presented in Bombay by March 25, for the supply of locomotive boilers. Further details can be obtained from the Department of Overseas Trade, London, S.W.1.

L.M.S.R. Goods Depot Improvements

The L.M.S.R. announces that improvements are to be put in hand at four goods depots as follow :—

Blackpool : Erection of a goods shed fitted with the latest appliances for handling traffic under cover ; a new office building, and improved warehouse accommodation.

St. Helens : Provision of electric gantry crane capable of lifting heavy or light weights, as well as electric capstan power for the movement of wagons to and from the goods shed.

Rugby : Remodelling of the interior of the existing goods shed which will facilitate the handling of traffic.

Wigan : Installation of electric capstan power for movement of wagons, together with improved lighting for the whole of the goods station.

Forthcoming Events

Mar. 6 (*Fri.*).—Institute of Transport (Leeds), at Town Hall, 6.30 p.m. " The Future of Transport," by Mr. G. Lissenden.

Institution of Mechanical Engineers, Storey's Gate, London, S.W.1, 7 p.m. " The Importance in Practice of the Lower Yield Point in Mild Steel," by Prof. B. Haigh.

Mar. 7 (*Sat.*).—Permanent Way Institution (Manchester–Liverpool), at Victoria Station, Manchester, 3 p.m. " Method and Neatness in Permanent Way Maintenance," by Mr. J. Dawson.

Stephenson Locomotive Society (Midland–Northern), at 4, Bury Old Road, Cheetham Hill, Manchester, 6.30 p.m. " Railways of Bulgaria and Jugoslavia," by Mr. S. Beaver.

Mar. 9 (*Mon.*).—City of Birmingham Commercial College, at the University, Edmund Street, 7.30 p.m. " Selling Transport," by Mr. F. W. Lampitt.

Permanent Way Institution (London), at Southern Railway Staff Dining Room, Waterloo Station, 7 p.m. " Reconstruction of Sewer at King's Cross Station, L.N.E.R.," by Mr. C. Reddington.

Stephenson Locomotive Society (London), at L.N.E.R. Dining Club Room, King's Cross Station, 6.30 p.m. " John Ramsbottom—Designer of L.N.W.R. Locomotives," by Mr. F. Hambleton.

Mar. 10 (*Tues.*).—Institute of Transport (Birmingham), at Queen's Hotel, 6 p.m. " The Handling of Traffic at Goods Stations," by Mr. R. Frost.

Institute of Transport (Metropolitan Graduate), at Inst. of Electrical Engineers, Savoy Place, W.C.2, 6 p.m. " England's Silent Highways," by Mr. E. Chace-Carr.

Institution of Civil Engineers, Great George Street, London, S.W.1, 6 p.m. " The Construction of the Mersey Tunnel," by Mr. D. Anderson.

L.N.E.R. (Middlesbrough) Lecture and Debating Society, at Cleveland Scientific Inst., Corporation Road, 7.15 p.m. Annual General Meeting and Reading of Prize Essay.

L.N.E.R. (Newcastle–Sunderland), at Newcastle, 7 p.m. Annual Meeting. " The German Railways," by Mr. E. Arkle.

Permanent Way Institution (Sheffield). Annual Dinner.

Permanent Way Institution (York), at Railway Inst., Queen Street, 6.30 p.m. " Derailments," by Mr. J. Lovatt.

Mar. 11 (*Wed.*).—Institute of Fuel (London), at Chemical Society, Burlington House, Piccadilly, W.1, 6 p.m. " The Formation of Coal, with Particular Reference to its Behaviour under Heat and Pressure," by Mr. E. Lewis.

Institute of Metals (London), at Inst. of Mechanical Engineers, Storey's Gate, S.W.1, 10 a.m. Annual General Meeting. Dinner and Dance at Trocadero Restaurant, Shaftesbury Avenue, 7 p.m.

Institute of Welding (Scottish), at 207, Bath Street, Glasgow, 7.30 p.m. " Specifications, Testing and Inspection of Welds," by Mr. J. Paterson.

L.N.E.R. (Cambridge) Lecture and Debating Society, at Railway Social Club, 7 p.m., on " Some Lessons from the Events of 1935," by Mr. R. Bell.

L.N.E.R. (Darlington) Lecture and Debating Society, at North Road Inst., 7.30 p.m. Annual General Meeting and Reading of Prize Essay.

Mar. 12 (*Thurs.*).—Institution of Structural Engineers (London), at 10, Upper Belgrave Street, S.W.1, 6.30 p.m. " Experiments on Stress Distribution in Reinforced Concrete Beams," by Mr. R. Evans.

Railway Club, at Royal Scottish Corporation Hall, Fetter Lane, London, E.C.4, 7.30 p.m. " The Western Section of the Former Great Central Railway," by Mr. E. Woodniffe-Peacock.

Mar. 13 (*Fri.*).—Institute of Transport (Newcastle), at Royal Station Hotel, 7.30 p.m. " Speculations as to the Future of Transport," by Mr. D. Halliwell.

Royal Society of Arts (Indian), John Street, London, W.C.2, 4.30 p.m. " The Development of Indian Ports," by Sir R. Glancy, K.G.I.E.

PARLIAMENTARY NOTICE

In Parliament.—Session 1935-36.

Great Western Railway
(Additional Powers.)

ADDITIONAL PROVISION.

NOTICE is hereby given that application is intended to be made to Parliament by the Great Western Railway Company (hereinafter referred to as "the Company") by Petition for Additional Provision for leave to introduce provisions and amendments into the Bill now pending in Parliament under the above name or short title and intituled "A Bill to empower the Great Western Railway Company to construct railways and other works in connection with their undertaking and to acquire lands; to authorise financial arrangements with respect to certain works and facilities to be provided by the said Company under an Agreement with the Treasury; to abandon certain railways; to raise additional capital and for other purposes."

A Notice containing a concise summary of the purposes of the intended Additional Provision has been published in full or sent for publication in full in "The Times" newspaper of the 28th February and 6th March, 1936.

And notice is hereby given that plans and sections relating to the beforementioned provisions and amendments together with books of reference to such plans were on or before the 27th day of February in the present year deposited for public inspection as follows (that is to say):—

(1) As regards the works and lands in the County of Somerset with the Clerk to the Council of that County at his office at Taunton; as regards the works and lands in the County of Cornwall with the Clerk to the Council of that County at his office at Truro; as regards the works and lands in the County of Berks with the Clerk to the Council of that County at his office at Reading; and as regards the lands in the County of Devon with the Clerk to the Council of that County at his office at Exeter.

(2) As regards the works and lands in the City and County Borough of Oxford with the Town Clerk to that City and County Borough at his office at Oxford.

And that copies of the said plans sections and books of reference as relates to the several areas hereinafter mentioned in or through which the intended works are proposed to be made or lands are situate were on or before the 27th day of February deposited as follows (that is to say):—

As relates to any non-County Borough with the Town Clerk to such Borough at his office; as relates to any Urban District (not being a Borough) or to any Rural District with the Clerk to the Council of such District at his office; as relates to any Parish comprised in a rural district (other than the Parishes hereinafter mentioned) with the Clerk to the Parish Council or if there be no Clerk with the Chairman of that Council; and as relates to each of the following Parishes (that is to say): East Anstey, Filleigh and South Hinksey with the Chairman of the Parish Meeting of each such Parish and such deposit was if made with the Clerk to the Parish Council made at his office or if he had no office at his residence and if made with the Chairman of the Parish Council or Chairman of the Parish Meeting at their respective residences.

Printed copies of the said additional provision may be inspected or copies thereof obtained at the price of one shilling for each copy at the respective offices of the undersigned Solicitor and Parliamentary Agent and at the office of the Station Master at the Company's stations at Taunton, Barnstaple, Newquay, Looe, Abingdon, Oxford and Porthcawl respectively.

Dated this 27th day of February, 1936.

A. G. HUBBARD,
Great Western Railway
Station, Paddington, W.2.
Solicitor.

C. H. WHITELEGGE,
1, The Abbey Garden,
Westminster, S.W.1.
Parliamentary Agent.

OFFICIAL NOTICES

South Indian Railway Company Limited

THE Directors are prepared to receive Tenders for the supply of:—

STEEL TYRES.

Specifications and Forms of Tender will be available at the Company's Offices, 91, Petty France, Westminster, S.W.1.

Tenders addressed to the Chairman and Directors of the South Indian Railway Company Limited, marked "Tender for Steel Tyres," with the name of the firm tendering, must be left with the undersigned not later than 12 Noon on Friday, the 20th March, 1936.

The Directors do not bind themselves to accept the lowest or any Tender.

A charge, which will not be returned, will be made of 5s. for each copy of the Specification.

Copies of the drawings may be obtained at the Offices of the Company's Consulting Engineers, Messrs. Robert White & Partners, 3, Victoria Street, Westminster, S.W.1.

E. A. S. BELL,
Managing Director.

91, Petty France,
Westminster, S.W.1.
4th March, 1936.

GOVERNMENT OF INDIA

APPLICATIONS are invited for an appointment as Assistant Engineer (Inspection) in the Indian Stores Department. Candidates must be British subjects or subjects of an Indian State, aged between about 24 and 35 years, and should possess an engineering degree or diploma qualifying for exemption from, or should have passed, the examination for A.M.Inst.C.E., the A.M.I.Mech.E. or Associate of the Institution of Engineers (India). They should have served an apprenticeship or pupilage of not less than three years with a firm of steel railway wagon builders or in railway workshops, followed by at least two years' experience in a responsible post connected with the fabrication of steel railway wagons or in railway workshops. During apprenticeship or subsequently, at least six months should have been spent in a drawing office. Full practical experience essential. Agreement for five years in first instance. Pay scale Rs. 350 rising by annual increments of Rs. 25 to Rs. 550 a calendar month and thence by increments of Rs. 30 to Rs. 700 a calendar month. In addition, Overseas Pay will be granted to officer of non-Asiatic domicile. Free passage to India. Compensatory and house rent allowances. Provident Fund.

Further particulars and Forms of Application may be obtained, on application by postcard, from the High Commissioner for India, General Department, India House, Aldwych, London, W.C.2. Last date for receipt of applications, 20th March, 1936.

THE MADRAS & SOUTHERN MAHRATTA RAILWAY COMPANY LIMITED invite Tenders for:—

15 BOILERS FOR LOCOMOTIVES—BROAD GAUGE, viz., 7 Boilers for F.S. 2-6-4 type Tank Locomotives; 8 Boilers for V.S. 0-5-0 type Goods Locomotives.

Specification and Form of Tender can be obtained at the Company's Offices, 25, Buckingham Palace Road, Westminster, London, S.W.1.

Fee ONE GUINEA *which will not be returned.*

Tenders must be submitted not later than 2 o'clock p.m. on TUESDAY, 31ST MARCH, 1936.

The Directors do not bind themselves to accept the lowest or any Tender and reserve to themselves the right of reducing or dividing the order.

By Order of the Board,
G. W. V. DE RHE PHILIPE,
Secretary.

Traction

LARGE concern requires for leading position an Electrical Engineer with extensive experience in traction matters, more particularly operating conditions and motor construction. Apply giving full details, experience, training, and salary required, to Box No. 20, c/o THE RAILWAY GAZETTE, 33, Tothill Street, London, S.W.1.

ADVERTISER having established Works in India would like to get into communication with firm desiring to have their goods manufactured in that country. Sales organisation exists. Communications will be treated as confidential. Reply in first instance, Box No. 2, c/o THE RAILWAY GAZETTE, 33, Tothill Street, Westminster, London, S.W.1.

PATENTS for Inventions, Trade Marks, Advice, Handbook, and consultations free. King's Patent Agency, Ltd. (B. T. King, C.I.M.E., Registered Patent Agent, G.B., U.S., and Canada), 146A, Queen Victoria Street, London, E.C.4. 50 years' references. 'Phone City 6161.

FIRST OF THE L.N.E.R. "FOOTBALL" LOCOMOTIVES.—Yesterday (Thursday) afternoon, Lord Lonsdale visited King's Cross station, L.N.E.R., in his capacity as chairman of the Arsenal Football Club, and performed the naming ceremony of the first of the new locomotives to be named after sporting clubs. This engine, No. 2848, which is called *Arsenal*, after the famous London Association football club, was named in the presence of the Arsenal football team, with Mr. G. F. Allison, its manager, Mr. William Whitelaw, chairman of the L.N.E.R., Sir Ralph L. Wedgwood, Chief General Manager, and Mr. H. N. Gresley, Chief Mechanical Engineer, designer of the locomotive. The engine has just been built at Darlington works and generally conforms to the "Sandringham" type, introduced for main line service in East Anglia. It is a 4-6-0, has three 17½ in. by 26 in. cylinders, and is fitted with the patent Gresley valve gear. The working pressure is 200 lb. per sq. in., and the weight of the engine in working order is 76 tons 13 cwt., exclusive of the tender, which weighs 44 tons 4 cwt. The total weight, therefore, exceeds 120 tons.

Railway Share Market

Home Railway stocks have been a prominent feature of the Stock Exchange this week owing to various favourable factors which combined to emphasise that the recovery in the earning power of the main line railways may be accelerated this year. The statements at the L.M.S. meeting last week and at the Southern meeting, particularly the references to the good return shown on the money so far expended on electrification, created an excellent impression in the market.

Moreover, the large amounts which are apparently to be expended on re-equipping the defence forces will stimulate activity in the heavy industrial centres of the N.E. Coast and elsewhere, and this in its turn will be expected to benefit the traffics of the L.N.E.R. and L.M.S.R. and to a lesser extent the Great Western. L.M.S. issues responded on Wednesday to the news of the good traffic increase of £52,000 and there was a sharp gain in the 4 per cent. preference and 1923 preference. The prior charges were higher in most cases. L.N.E.R. first and second preference were also better, aided by the £46,000 increase in the traffics, and the preferred and deferred showed a firmer tendency. Great Western, which has been attracting more attention since the meeting last week, have moved up 3 points to 49, it being felt in the market that there are probably reasonably good grounds for expecting the dividend again to be kept at 3 per cent. for the current year. Southern preferred was good, last week's decline having had the effect of emphasising the apparently attractive yield offered. The deferred was in larger demand and has improved on the week from 21 to 24⅛. The market was particularly impressed by the particulars mentioned at the meeting as to the good return on the sums expended on electrification, as the further amounts to be used in this direction should presumably give an even better return, since the money is being obtained on favourable terms as a result of the Government's scheme to assist the main line railways in developments and improvements. There was very little activity in foreign railway stocks. Canadian Pacific continued to attract attention.

Traffic Table of Overseas and Foreign Railways Publishing Weekly Returns

	Railways	Miles open 1935-36	Week Ending	Traffics for Week: Total this year	Traffics for Week: Inc. or Dec. compared with 1935	No. of Weeks	Aggregate Traffics to Date: Totals: This Year	Aggregate Traffics to Date: Totals: Last Year	Aggregate Traffics to Date: Increase or Decrease	Shares or Stock	Prices: Highest 1935	Prices: Lowest 1935	Prices: Mar 4, 1936	Yield (See Note)
				£	£		£	£	£					
South & Central America.	Antofagasta (Chili)&Bolivia	834	1.3.36	10,750	– 5,160	9	124,740	112,820	+ 11,920	Ord. Stk.	23	14 15/16	23 1/2	Nil
	Argentine North Eastern ..	753	29.2.36	7,264	+ 426	35	272,992	253,422	+ 19,570	,,	7	4	5	Nil
	Argentine Transandine ..	—	—	—	—	—	—	—	—	A. Deb.	49 1/2	30	50	8
	Bolivar	174	Jan., 1936	5,500	– 350	5	5,500	5,850	– 350	6 p.c. Deb.	13	5	10	Nil
	Brazil	—	—	—	—	—	—	—	—	Bonds.	14	11	14	39/16
	Buenos Ayres & Pacific ..	2,806	29.2.36	102,173	+ 4,123	35	2,797,104	2,540,407	+ 256,697	Ord. Stk.	101 2/8	47 5/8	91/2	Nil
	Buenos Ayres Central ..	190	15.2.36	$89,500	– $7,500	33	$3,841,900	$3,730,300	+ $111,600	Mt. Deb.	21	10	17 1/2	Nil
	Buenos Ayres Gt. Southern	5,085	29.2.36	154,257	– 55,554	35	4,498,218	4,898,467	– 400,249	Ord. Stk.	27	13 1/2	19	Nil
	Buenos Ayres Western ..	1,930	29.2.36	60,658	+ 7,467	35	1,537,804	1,521,726	+ 16,078	,,	24	10	15 1/2	Nil
	Central Argentine	3,700	29.2.36	119,005	+ 580	35	4,249,641	4,129,347	+ 120,294	,,	177 5/8	7	12 1/2	Nil
	Do.	—	—	—	—	—	—	—	—	Dfd.	9	3 1/4	6 1/2	Nil
	Cent. Uruguay of M. Video	273	22.2.36	14,658	+ 3,809	34	361,394	499,364	– 137,970	Ord. Stk.	81 2/8	3	7	Nil
	Do. Eastern Extn.	311	22.2.36	2,721	+ 693	34	66,538	63,987	+ 2,551	—	—	—	—	—
	Do. Northern Extn.	185	22.2.36	1,790	+ 476	34	47,137	34,637	+ 12,500	—	—	—	—	—
	Do. Western Extn...	211	22.2.36	1,226	+ 358	34	29,714	27,345	+ 2,369	—	—	—	—	—
	Cordoba Central	1,218	29.2.36	22,900	– 800	35	1,011,230	1,011,390	– 160	Ord. Inc.	4	1	2 1/2	Nil
	Costa Rica	188	Dec., 1935	12,022	– 6,924	26	80,721	99,051	– 18,330	Stk.	35	30	35	5 11/16
	Dorada	70	Jan., 1936	13,300	+ 2,800	5	13,300	10,500	+ 2,800	1 Mt. Db.	103 5/8	102 1/2	104 1/2	5 3/4
	Entre Rios	810	29.2.36	9,818	– 2,569	35	389,134	442,064	– 52,930	Ord. Stk.	15	6 1/2	10	Nil
	Great Western of Brazil ..	1,082	29.2.36	9,500	– 1,800	9	89,100	101,300	– 12,200	Ord. Sh.	1/2	3/16	1/2	Nil
	International of Cl. Amer.	794	Jan., 1936	$501,540	+ $72,063	5	$501,540	$429,477	+ $72,063	—	—	—	—	—
	Interoceanic of Mexico ..	—	—	—	—	—	—	—	—	1st Pref.	1/2	3/32	1/2	Nil
	La Guaira & Caracas ..	22 1/4	Jan., 1936	4,425	+ 1,325	5	4,425	3,100	+ 1,325	S:k.	8 1/2	8	8 1/2	Nil
	Leopoldina	1,918	29.2.36	15,591	– 2,422	9	164,256	154,323	+ 9,933	Ord. Stk.	8 1/2	2 1/2	7	Nil
	Mexican	483	29.2.36	$313,500	+ $105,000	9	$2,124,100	$1,990,300	+ $133,800	,,	1 1/2	1/4	1	Nil
	Midland of Uruguay ..	319	Jan., 1936	9,440	– 3,842	31	48,136	79,115	– 30,979	,,	1 1/2	1 1/2	1 1/2	Nil
	Nitrate	401	29.2.36	5,893	– 1,279	9	29,354	26,345	+ 3,009	Ord. Sh.	64/–	42/–	25/8	Nil
	Paraguay Central	274	29.2.36	$2,344,000	+ $1,103,000	35	$72,406,000	$36,378,000	+ $36,028,000	Pr. Li. Stk.	80 1/2	60	77	7 11/16
	Peruvian Corporation ..	1,059	Feb., 1936	78,640	+ 15,819	35	616,056	499,646	+ 116,410	Pref.	106 5/8	67 1/16	141/2	Nil
	Salvador	100	22.2.36	¢30,500	– ¢14,750	34	¢609,896	¢622,402	– ¢12,506	Pr. Li.Db.	65	61	65	7 11/16
	San Paulo	153 1/2	23.2.36	24,236	+ 748	8	209,903	168,482	+ 41,421	Ord. Stk.	80	35	65 1/2	3 15/16
	Taltal	164	Jan., 1936	3,215	– 657	31	23,915	17,442	+ 6,473	Ord. Sh.	11 1/16	1 1/8	1 5/8	7 1/4
	United of Havana	1,353	29.2.36	56,201	+ 1,121	35	690,794	722,065	– 31,271	Ord. Stk.	3 1/16	1	3	Nil
	Uruguay Northern	73	Jan., 1936	841	– 311	31	5,560	8,446	– 2,886	Deb. Stk.	4 1/2	2 1/16	4 1/2	Nil
Canada.	Canadian National	23,684	21.2.36	$25,437	+ 12,802	8	4,384,420	4,251,702	+ 132,718	—	—	—	—	—
	Canadian Northern ..	—	—	—	—	—	—	—	— 4 p.c.	Perp. Dbs.	78 5/8	52 1/2	69	5 15/16
	Grand Trunk	—	—	—	—	—	—	—	—	4 p.c. Gar.	103 5/8	93	104 1/2	3 15/16
	Canadian Pacific	17,260	29.2.36	545,000	+ 115,400	9	3,720,300	3,384,600	+ 336,200	Ord. Stk.	14 1/16	8 3/4	14 1/2	Nil
India.†	Assam Bengal	1,329	10.2.36	38,250	– 5,229	45	1,087,189	1,233,665	– 146,476	Ord. Stk.	92 1/8	77 1/2	84 1/2	39/16
	Barsi Light	202	10.2.36	4,890	+ 1,538	45	123,787	121,492	+ 2,295	Ord. Sh.	105	77 1/2	73 1/2	6 15/16
	Bengal & North Western ..	2,112	10.2.36	81,128	– 14,640	45	960,616	971,122	– 10,506	Ord. Stk.	301 1/2	291	303 1/2	5 1/4
	Bengal Dooars & Extension	161	10.2.36	3,346	– 270	45	121,615	137,172	– 15,557	,,	127 1/2	122	122 1/2§	5 11/16
	Bengal-Nagpur	3,268	31.1.36	205,350	– 4,944	43	5,321,179	4,922,786	+ 398,393	,,	105	100 5/16	102 1/2	3 7/8
	Bombay, Baroda & Cl. India	3,072	20.2.36	278,775	+ 15,675	46	7,276,200	7,371,225	– 95,025	,,	115 1/4	110	112 1/2	5 5/16
	Madras & Southern Mahratta	3,230	10.2.36	155,325	– 1,895	45	4,602,546	4,799,378	– 196,832	,,	128 1/2	113 7/8	115 1/2	7 1/4
	Rohilkund & Kumaon ..	572	10.2.36	19,277	+ 320	45	488,491	189,795	– 1,304	,,	294	262	297 1/2	5 8
	South India	2,526	31.1.36	108,102	– 17,524	43	3,280,343	3,451,912	– 171,569	,,	119 3/4	104 1/4	106 1/2	7 1/16
Various.	Beira-Umtali	204	Dec., 1935	£3,267	+ 7,772	13	193,193	180,985	+ 12,208	—	—	—	—	—
	Bilbao River & Cantabrian	15	Jan., 1936	1,317	– 932	5	1,317	2,249	– 932	—	—	—	—	—
	Egyptian Delta	622	10.2.36	6,932	– 309	45	219,712	210,365	+ 9 347	Prf. Sh.	2	15/8	1 1/4	5 11/16
	Great Southern of Spain ..	104	22.2.36	828	– 787	8	9,407	15,740	– 6,333	Inc. Deb.	3 1/2	2	3 1/2	Nil
	Kenya & Uganda	1,625	Nov., 1935	182,196	+ 11,855	48	2,184,339	2,030,213	+ 154,126	—	—	—	—	—
	Manila	—	—	—	—	—	—	—	—	B. Deb.	48	36	47 1/2	7 5/8
	Mashonaland	913	Dec., 1935	99,331	– 10,413	13	313,033	342,255	– 29,222	1 Mg. Db.	104 1/4	100	104	4 13/16
	Midland of W. Australia ..	277	Dec., 1935	14,842	+ 324	26	83,624	85,948	– 2,324	Inc. Deb.	98 3/4	93	94 1/2	5 5/16
	Nigerian	1,905	11.1.36	58,687	– 277	41	1,413,958	1,508,338	– 94,380	—	—	—	—	—
	Rhodesia	1,538	Dec., 1935	185,464	+ 3,848	13	575,986	556,652	+ 19,334	4 p.c. Db.	105 1/2	101	105	3 13/16
	South African	13,246	8.2.36	618,023	+ 77,463	45	25 639,946	23,209,273	+ 2,480,673	—	—	—	—	—
	Victoria	4,728	Nov., 1935	823,035	– 25,801	21	3,959 297	3,881,659	+ 77,638	—	—	—	—	—
	Zafra & Huelva	112	Jan., 1936	10,488	– 895	5	10,488	11,383	– 895	—	—	—	—	—

NOTE.—Yields are based on the approximate current prices and are within a fraction of 1/16

† Receipts are calculated @ 1s. 6d. to the rupee. § ex dividend. Salvador and Paraguay Central receipts are in currency.

The variation in Sterling value of the Argentine paper peso has lately been so great that the method of converting the Sterling weekly receipts at the par rate of exchange has proved misleading, the amount being overestimated. The statements from July 1 onwards are based on the current rates of exchange and not on the par value

Electric Railway Traction

The Portsmouth Electrification

IT had been known for a good while past that the Southern Railway intended to proceed with the conversion of the main line to Portsmouth at the earliest convenient moment, and little surprise—although much satisfaction—was expressed near the end of 1935 when it was announced that under the Railways (Agreement) Act the work was to be put in hand immediately, and would be followed by extensions of the existing electrified system to Chatham, Maidstone, Hastings via Tonbridge, and Portsmouth via Horsham and Chichester. The lines at present being electrified (see also map on p. 1042 of the *Electric Railway Traction Supplement* for December 13, 1935) are from Hampton Court Junction to Portsmouth; from Woking to Aldershot and Alton; and from Weybridge to Egham and Staines, and comprise 95 route and about 240 track miles, and further details of this scheme, which it is hoped will be completed by July, 1937, have become available. The whole programme will cost nearly £3,000,000, or approximately £30,000 per route mile and £12,000 per track mile including rolling stock. Two control rooms are being provided, one at Woking and one at Havant, and from these the operations of the 26 rectifier substations and 18 track-paralleling huts will be controlled. The erections for six of the substations are now complete, and in three the installation of the electrical equipment is proceeding. Current for the services on the new electric lines, except those in the Western Section suburban area, will be obtained from the grid substations at Woking and Portsmouth (Wymering); to cope with the increased energy demand from the Staines line and the suburban services on the main line, the Southern Railway's own power station at Wimbledon (built in 1915 by the L.S.W.R.) is being enlarged.

Rolling stock now being built at Eastleigh for use on the Portsmouth and subsidiary lines comprises 48 four-car corridor sets (19 with kitchen cars); 38 two-car sets with lavatory accommodation; 8 two-car ordinary non-corridor sets; 6 three-car motor sets; and 5 two-car trailer sets. The aggregate motor horse-power of all this stock will be about 75,000. New cleaning sheds are to be erected at Wimbledon Park and Fratton; special berthing sidings are to be provided at Woking, Guildford, and Chertsey, and the repair shops at Durnsford Road, Wimbledon, will be extended. Portsmouth Harbour station will be reconstructed, and alterations will be made to the stations at Guildford, Aldershot, Haslemere, Portsmouth and Southsea, and to certain smaller stations. Although the full details of the electric services have not yet been worked out, the general proposals are to have one fast through train an hour from Waterloo to Portsmouth, calling at Guildford and Haslemere; two stopping trains an hour, calling at Surbiton and all stations thence to Portsmouth; and one additional train every hour during the rush periods, calling at all the principal stations. At week-ends in the summer the service will be augmented considerably in order to deal with the heavy traffic to the Isle of Wight, and on Saturdays a basis of four fast through trains an hour has been proposed.

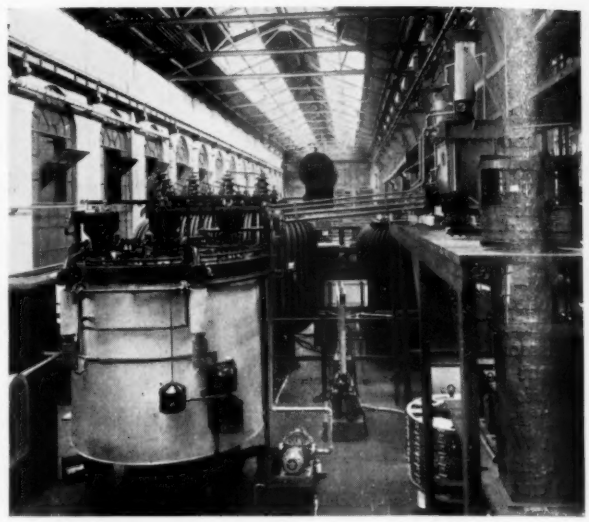
The new substation building, third rails, and track layout at Weybridge Junction, Southern Railway

SUBSTATION EQUIPMENT FOR POLAND

British-built rectifiers for 3,000-volt d.c. lines around Warsaw

INCLUDED in the contract placed with British firms in 1933 for the electrification of certain lines of the Polish State Railways in the vicinity of Warsaw were 14 mercury arc rectifier equipments for installation in five substations. The contract signed between the Polish Government on the one hand and the Metropolitan-Vickers Electrical Co. Ltd. and the English Electric Co. Ltd. on the other, provided for the supply of English Electric substation apparatus and the first rectifier sets have now been completed.

Preliminary particulars of the contract, and details of the proposed main line electrification schemes of the Polish State Railways were given in the issue of the *Electric Railway Traction Supplement* for January 12, 1934, together with particulars of the estimated operating costs of steam and electric traction. The Warsaw electrification covers the conversion of approximately 135 miles of track to the 3,000-volt d.c. system, this relatively high voltage being chosen because of the future electrification of the trunk lines.



English Electric rectifier substation equipment for Polish State Railways as erected at Stafford works for testing

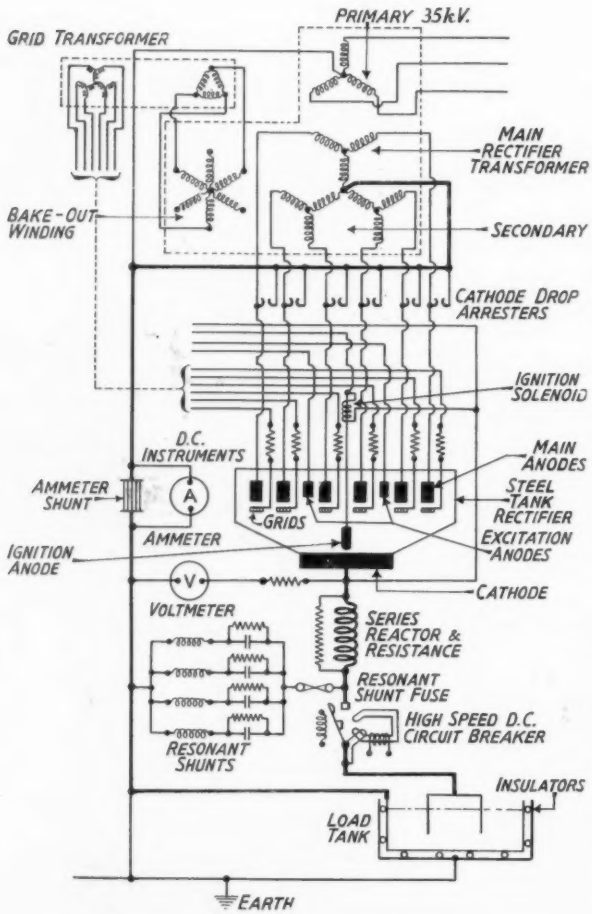


Fig. 1—Diagram of substation connections, Polish State Railways

The material built by the English Electric Co. Ltd. includes the rectifiers and their auxiliaries and control cubicles, smoothing reactor, and main transformer; the main high-speed circuit breakers for the rectifiers were constructed by the Metropolitan-Vickers Electrical Co. Ltd. A three-phase 50-cycle 35 kV. supply is being taken in Poland, but for the tests at the Stafford works of the builder a step-up transformer was inserted in the main circuit to raise the voltage of the local supply from 6·6 kV. to 35 kV. The details of the substation equipment as they were located for testing at Stafford are shown in the illustration at the top of this page. Adjacent to the steel tank rectifier is the motor-driven cooling water pump, and to the left hand of the rectifier is the control cubicle. On the right hand at the bottom is the reactor, and behind and above it the air-blast recooler. In the centre is the high-speed breaker and behind it to the left is the main transformer. The transformer to the right is the step-up unit.

Transformer

The transformer for each rectifier is of the three-phase core type, oil-immersed with natural cooling. At the normal rated output the temperature rise in the transformer does not exceed 55° C. by resistance or 50° C. by thermometer. The primary windings are star connected, and the secondary windings in six-phase fork, or double zig-zag.

Three vertical links of stepped section form the cores; they are approximately circular. The punchings of the limbs and the top and bottom yokes are interleaved, and the coils are wound concentrically on the limbs, the high-voltage winding being outside and the low voltage inside. The former consists of helical disc coils with a single turn per layer and an oil space between each pair of coils. The low voltage winding comprises a spiral coil so arranged that all the phases have the same reactance to the primary to ensure that the load will be shared equally and that there will be an even distribution of load

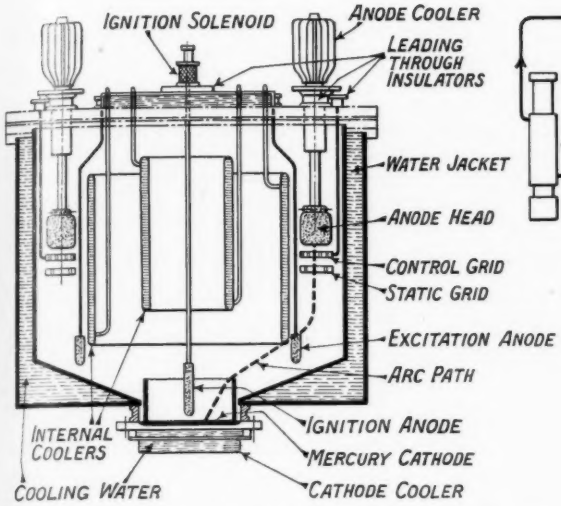


Fig. 2—Diagrammatic section through English Electric steel tank mercury arc rectifier

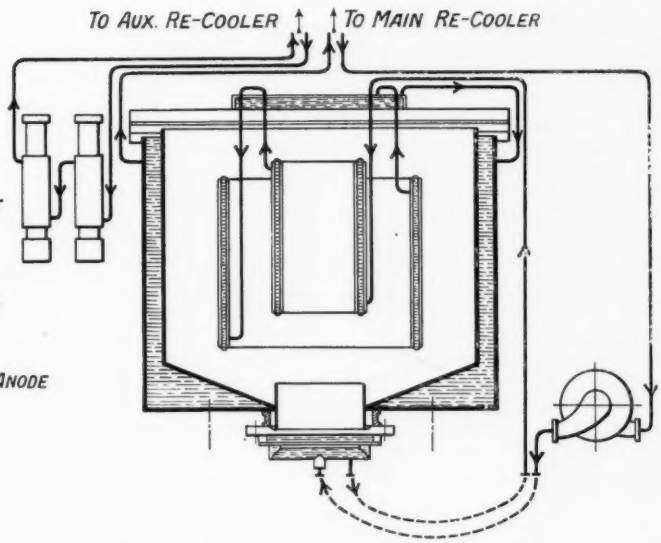


Fig. 3—Diagram of water cooling circuit for steel tank mercury arc rectifier

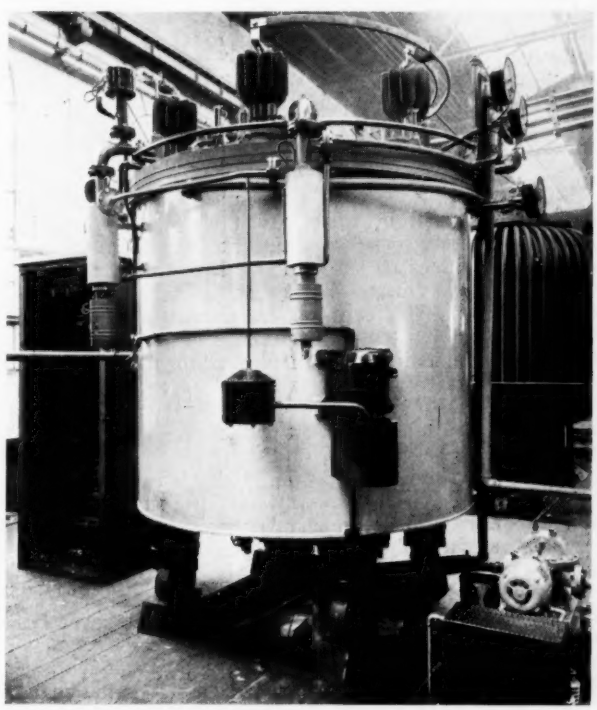
over the flat surface of the winding; in the event of a backfire the turns are separated by radial oil spaces. For baking out the rectifier, a third winding is incorporated in the transformer; it consists of a disc coil at the bottom end of the high voltage column in each limb, and the middle of each coil is tapped and connected to the neutral lead so that the coils form a six-phase double star-connected winding.

Boiler plate has been used for the tanks, and the external cooling tubes are welded to the sideplates. An expansion chamber and a silica-gel breather are mounted on the transformer, and other fittings include a dial-type thermometer, oil gauges, drain valves, relief diaphragms, and tapping switches for effecting small variations in the ratio without removing any part of the tank cover. The high voltage neutral is brought out for connection to protective arrangements. Lightning arrestors of the auto-valve type are connected to each anode terminal and the low-voltage neutral to limit the effect of surges generated in the windings by quick stopping and re-starting of the arc.

Rectifier

The rectifier is of the six-anode type, arranged for six-phase operation with anodes burning over a period of 60 deg. and in accordance with the specification is rated to give 2,000 kW. at 3,300 volts continuously with overloads of 25 per cent. for 15 min., and 200 per cent. momentarily. It is fitted with control grids in the arc path, so that the controlling features of the energised grid, such as d.c. voltage variation or grid switching, can be utilised. At present the rectifier will be used in the ordinary manner with plain characteristics. In normal service the grids would be energised by a.c. voltage, bearing a certain phase relationship to the anode voltage, from an auxiliary transformer housed in the excitation unit, and connected to the 220-volt auxiliary supply. A diagrammatic section of the English Electric steel tank rectifier is shown in Fig. 2. The incoming supply to the rectifier is six-phase 50-cycles 2,650 volts, and the d.c. delivery on the continuous rating is 3,300 volts 607 amp.

The vacuum indicating equipment is of the Pirani electrical type and consists of the transmitter, or detector, which is fitted in the vacuum pipe line of the rectifier, and an indicating instrument reading directly in microns ($\frac{1}{1000}$ mm. Hg) fitted in the control cubicle. This system depends on the principle that the resistance of a wire (with high temperature coefficient of resistance) heated at constant potential in a vacuum varies according to the quality of the vacuum. As the vacuum improves its power of conducting heat away is diminished, and the wire becomes hotter with consequent increase in resistance. This wire is situated in a protecting vessel in communication with the vacuum chamber and forms one arm of a Wheatstone bridge connection of resistance fitted in the



2,000 kW. steel tank mercury arc rectifier for the Polish State Railways

transmitter housing and which is supplied at a constant potential through a Barretter resistance. The indicating instrument records the variation in current in the bridge and is calibrated to read in microns as mentioned above.

The vacuum condition in the rectifier is obtained by means of two three-stage diffusion mercury vapour pumps, each connected by its vacuum pipe to the rectifier, and to a common pipe line on the outlet side which leads to the barometric seal and preliminary rotary pump. The barometric seal consists of a 760 mm. column of mercury between the m.v. and rotary pumps, which protects the rectifier vacuum chamber from an influx of air and gases when the rotary vacuum pump is shut down. The barometric seal is combined with an oil trap to prevent oil from coming in contact with the mercury when the pump is shut down.

The heaters of the mercury vapour pumps are connected in parallel and are supplied from a small single-phase transformer. The energy consumption in this circuit is approximately 24 amp. at 60 volts. The preliminary rotary pump which provides a low backing pressure for the mercury vapour pumps is of the vane impeller type and runs submerged in oil. The driving motor is rated at 0·45 h.p. at 1,400 r.p.m. and takes its supply from the 220-volt auxiliary circuit.

The excitation or maintaining arcs in the rectifier are supplied with d.c. from an auxiliary rectifier of the metal-oxide type fitted in the excitation unit, the output of which is 15 amp. at 75-80 volts. The rectifier has two fixed excitation anodes diametrically opposite to each other and near the ring of main anodes; and a central movable anode, which also serves as the ignition device. When the excitation circuit is energised the central anode is drawn down to the mercury cathode by a solenoid, and is immediately returned to its normal position by a mercury float. An arc is struck which is also transferred to the excitation anodes. The combined excitation current varies between 10 and 11 amp. on light load to 13 or 14 amp. on full load. The excitation by d.c. is stable and enables the main arcs to be maintained down to about zero load. Since the excitation circuit is at approximately the rectifier potential, the transformer supplying the metal oxide rectifier is specially insulated to serve also as an insulating transformer for the circuit.

Rectifier Cooling System

Dissipation of the losses occurring in the rectifier is mainly carried out by closed-circuit water cooling. The anodes are mainly cooled by conduction through the anode stems to the finned coolers on top. Mounted on the floor near the rectifier is the circulating pump for the main cooling circuit. This is of the horizontal type and driven by a 1 h.p. motor at 1,400 r.p.m. The insulating transformer for the motor is mounted near the latter.

Water delivered by the pump first enters the cooling chamber at the base of the cathode. It passes thence to the internal annular coolers within the vacuum tank, then to the cooling chamber on the other side of the anode plate, and finally to the water jacket surrounding the vacuum tank. The heated water then passes to the recooler from which it is again drawn in by the pump. A pressure gauge fitted with electrical contacts is placed in the water circuit between the cathode and internal coolers and is mounted on the side of the rectifier. Its function is to trip out the equipment in the event of failure of the water circulation. A dial type thermometer with electrical contacts is fitted to the outlet water pipe for temperature control of the recooler fan. It has maximum and minimum contacts with independent setting.

The main recooler unit consists of groups of finned radiator tubes assembled between headers in a rectangular housing. Air is forced over the tubes by the centrifugal blower mounted on the floor level which is driven by a 4 h.p. motor at 700 r.p.m. The recooling unit is at the rectifier potential and is mounted on insulators. An insulating section in the air trunk enables the fan chamber, trunking and driving motor to be at earth potential.

An auxiliary recooler is provided for cooling the water circulating in the jackets of the mercury vapour pumps. The recooler is of the horizontal type and is arranged to blow the air stream vertically. In construction it is generally similar to the main recooler. A motor of 1 h.p. at 1,400 r.p.m. drives both fan and circulating pump. The whole unit is at the rectifier potential and is mounted on insulators, the motor being supplied by a small insulating transformer mounted by the side of the unit. A pressure gauge fitted with electrical contacts is fitted on the rectifier in the pipe circuit, and is arranged to trip out the equipment in the event of failure of circulating water through the pumps.

Smoothing Equipment

The smoothing circuit is designed to limit the voltage ripple on the d.c. side to a value not exceeding 1·5 per cent. (r.m.s. value) of the d.c. voltage with a sine wave of supply voltage at the primary terminals. It consists of a series air-core reactor having an inductance of 3 m.H. connected on the positive lead from the rectifier together with four resonant shunt circuits tuned to frequencies of 300, 600, 900 and 1,200 cycles per sec. Each resonant circuit is made up of a reactor and condenser in series and the four circuits are protected by a h.t. fuse. The shunt reactors are made in two sections, which permits of adjustment of the inductance for tuning purposes by varying the distance between the section.

Rectifier Control Apparatus

A sheet steel cubicle with enamelled sheet steel front carries the various instruments and control relays necessary for the automatic starting and control of the rectifier and its associated equipment.

As will be seen from the photograph, the automatic vacuum indicating and control instrument and excitation ammeter, which are at a potential of 3,000 volts d.c. above earth, are mounted at the top of the cubicle and behind glass windows. All other high potential devices are suitably mounted inside the cubicle and are insulated from the low tension control circuits by means of small separating transformers.

The starting sequence is normally initiated by the closing of the main e.h.t. oil circuit breaker, the necessary vacuum and recooler pumps and starting excitation circuits being completed automatically in the required sequence. The last operation in the starting sequence is the closing of the d.c. high speed breaker, this operation only taking place provided everything is in order for taking load.

The equipment is normally shut down by opening the main e.h.t. oil circuit breaker, but should any fault develop, either during starting or running, the equipment is shut down automatically, and an indication given of the cause of the shut down by an announcing device. Those faults which cause shut down and lockout include failure of vacuum and water circulation, excessive temperature, and incomplete starting sequence.

A further feature of note is that the vacuum pumps are under the control of the vacuum control instrument at all times, thus ensuring a high degree of vacuum. As mentioned in the description of the rectifier cooling system, the fan of the main recooler is under automatic water temperature control. It is to be noted that the control switches on the panel are not normally operated, and are only provided for purposes of testing.

BRITISH RAILWAY ELECTRIFICATION

Views of Railway Chairmen

London Midland & Scottish Railway

So much publicity has already been given to the works to be undertaken that it is perhaps unnecessary to detail them here, but for the benefit of those who would like to have the particulars afresh, [some of] our works are as follows:—

(1) Electrification of portions of the company's railway in the Wirral peninsula and the establishment of through passenger train working over that railway and the Mersey Railway between Liverpool and New Brighton and Liverpool and West Kirby (including the provision of rolling stock and other equipment).

(2) Conversion of Stonebridge Park (Wembley) power station to 50 cycles frequency and alterations of substations and other works and equipment.—*Extract from the speech of Sir Josiah Stamp at the annual meeting of the L.M.S.R.*

Southern Railway

To Sir William Forbes we owe the reconstruction of Victoria station, many line widenings and improvements in our Continental services, but above all, his was the imaginative brain that first visualised the wide prospects of suburban electrification and its possible extension to the coast towns, a width of vision which has been followed and extended by our present General Manager, Sir Herbert Walker, to whom the Southern Railway owes so much of the outstanding success of the policy of electrification.

You will be interested to hear the satisfactory financial result of some of our latest electrification schemes. When the estimates were prepared in 1932 for the electrification of the line to Sevenoaks via Orpington and via Swanley, it was estimated that an increase of 27·1 per cent. on the then revenue of the area would be sufficient to pay the increased cost of working, including the interest on the amount charged to capital. Last year was the first year operated under electric traction and the number of passengers increased by 55 per cent. and the revenue by 41 per cent., as compared with 1932.

On the Eastbourne and Hastings section of electrification it was estimated that an increase of 1·25 per cent. in the receipts would have met the cost of electrification. As a matter of fact the number of passengers increased in the first six months—*i.e.*, from July to December last—by 22 per cent. and the revenue by 16 per cent.

In view of these satisfactory figures it will not surprise you that we have decided to go ahead with the electrification of other portions of our line. The amount the Southern Railway is to receive by way of loan [under the Railways (Agreement) Act, 1935] carrying interest at the rate of 2½ per cent. is approximately £6,000,000, and the works we have undertaken to carry out are the following: the construction of the first part of a new line from Motspur Park to Leatherhead; the electrification of the railway to Portsmouth, both via Guildford and via Horsham; the electrification of the line from Swanley Junction to Chatham and Gillingham, and from Gravesend to Maidstone via Strood; the electrification of the line from Sevenoaks to Hastings; and the improvement of certain of our stations, such as Templecombe, Twickenham and others.

We have already taken in hand the electrification of the line to Portsmouth via Guildford, and hope to have electric services in operation by the summer of 1937. The only liabilities we incur apart from the obligation of meeting the cost of interest on the loan and certain very small charges for management, is the issue by way of collateral security of an amount of £6,000,000 4 per cent. debenture stock, authority for which is being asked in the company's bill now before Parliament. There is no question of any public issue of stock in the near future.—*Extract from the speech of Mr. R. Holland-Martin at the annual meeting of the Southern Railway.*

London & North Eastern Railway

In the review of the company's business for 1934 reference was made to the question of the electrification of our Great Eastern suburban service, including a statement as to the consideration which the directors had given to that question from the time of amalgamation onwards. We had been forced to the conclusion that the electrification of the Great Eastern suburban lines could not be undertaken in the absence of a pool of competing interests and of substantial Government assistance. That both these deficiencies have now been met is a matter of great satisfaction to the directors. The first has been overcome by the formation of the London Passenger Transport Board and the creation of a pool of suburban passenger traffic established between that Board and the four main-line companies. The second deficiency has now also been met by the offer of Government assistance.

The scheme [for the electrification of the G.E.R. suburban lines] is a large one, involving very heavy specialised expenditure over a period of years. For this reason it was not possible to embark upon more comprehensive proposals. This limitation of the scheme has been a source of complaint from some sections of the suburban areas which were not included in it. The directors regret that such a feeling of disappointment should exist, but under the new conditions the decision does not rest with them. The London Passenger Transport Act of 1933 established a Standing Joint Committee, representing the Transport Board and the four main-line companies, to decide upon all questions of this character. The Committee has undertaken to consider the extension of electrification as soon as the developments at present in hand have made further progress.

This electrification of the Sheffield, Wath yard, and Manchester line does not mean that the directors have changed their views upon the subject of the general electrification of railways. The line referred to is peculiarly suitable for electric traction, offering as it does a high load factor which will enable us to secure a supply of current at a low rate; the mineral trains are extremely heavy, requiring quite exceptional power, and the electrification will at the same time solve problems in respect of the working of trains through Woodhead tunnel which have given us much concern in the past. The trains will be worked by electric locomotives, and the system will be that of direct current 1,500 volts with overhead conductors.—*Extract from the annual review of the company's business, issued with the annual report of the L.N.E.R.*

Mersey Railway

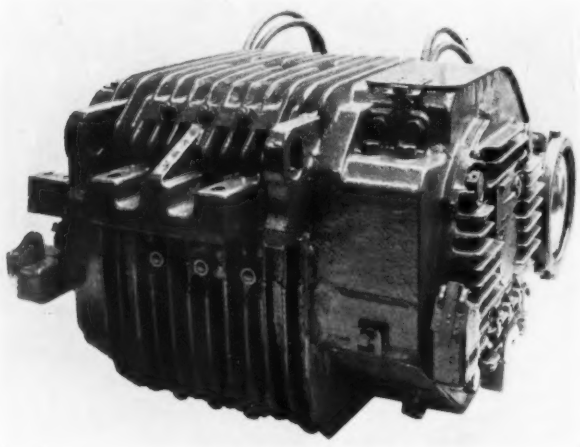
I am pleased to be able to announce that the L.M.S.R. have decided to proceed with the electrification of the Wirral section of their system and, in conjunction with this company to introduce a service of through electric trains between Liverpool and West Kirby and New Brighton.

It is proposed to run a 10 minutes' service between Liverpool and both these places during the morning and evening business periods and for a short period in the middle of the day, and during the remainder of the day a 15 minutes' service will be run. The trains of the Mersey Railway will operate the New Brighton service and new electric trains of the L.M.S.R. the West Kirby service.

The introduction of a quick electric service at regular short intervals has always tended materially to increase the number of passengers travelling, and it is confidently anticipated that the electrification of the Wirral section will prove no exception and any increase of through passengers from the Wirral section should improve the position of this company.—*Extract from the speech of Mr. John Waddell at the annual meeting of the Mersey Railway.*

The Limitations of D.C. and A.C. Motors*

IN a d.c. locomotive there are three things which prevent the designing of a motor to maintain its output up to the highest speeds, namely, (1) commutation, (2) heating, and (3) line voltage. With present designs of traction motors the average voltage between commutator bars is between 15 and 20. The lower this figure can be made the more stable the design will be. Unless the ratio of field ampere-turns to armature ampere-turns is made fairly high, field distortion is likely to raise the potential between individual bars to 40 or 50 volts. To design a



Metro-Vick nose-suspended 650-volt d.c. motor as used on the Southern Railway. The cooling ribs increase the surface exposed to the air by 80 per cent.

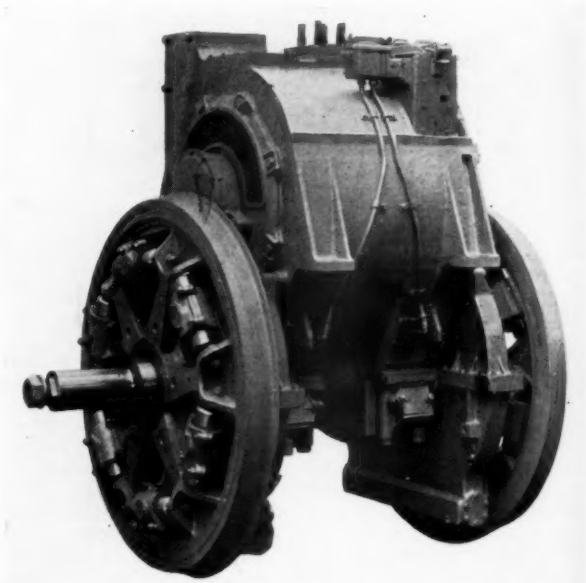
motor to reach its maximum horse-power at 600 volts, say, and to attempt to raise that voltage to 1,000, so as to maintain the maximum horse-power up to higher speeds, will then obviously raise commutation difficulties. In actual practice the motor voltage cannot be raised above the line voltage, except by boosters, but the effect of an increased terminal voltage is obtained by field-weakening. There is a limit to the extent of field-weakening, determined by the allowable ratio of armature ampere-turns to field ampere-turns. If this ratio is exceeded, trouble from flashing motors is likely to arise.

It would seem that considerable advantage could be derived from the use of compensating windings. In stationary practice it is usual to place a distributed compensating winding on all machines over 300 kW., and when this is done it is possible to withstand even short-circuits without flashing. The use of compensating windings on traction motors would allow considerably greater field weakening at high speeds without jeopardising commutation. The 870 h.p. (continuous) motors of locomotive E502 of the Paris-Orleans railway are, to the author's knowledge, the only traction motors equipped with compensating windings. On these motors it is possible to reduce the field ampere-turns to 26 per cent. of the full field values, as compared with 43 per cent. in the case of non-compensated motors of the same design.

The second limitation, that of heating, can be overcome by the use of forced ventilation. Forced cooling has always been standard on a.c. traction motors, but in d.c. service has been used only on the largest equipments. On the motors mentioned above, each motor has an external fan supplying 3,540 cu. ft. of air per min. This is an important factor in obtaining a high rating from a given frame. As design improves, heating always becomes the ultimate limitation, and it is probable that forced ventilation will become standard for d.c. traction motors in railway service.

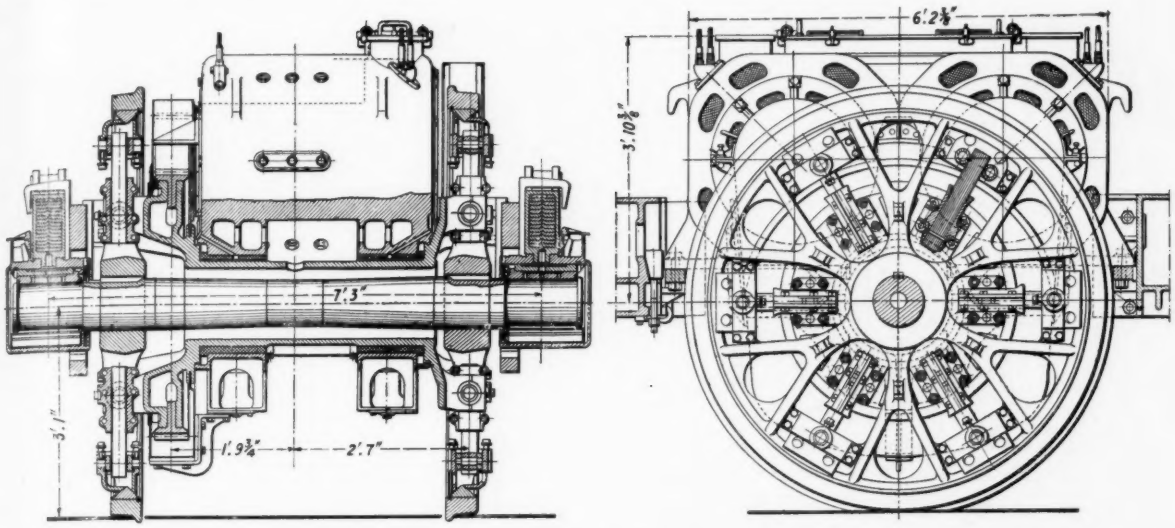
The third limitation mentioned above, that of line voltage, is not at present a serious one. Present methods of railway operation do not require a very high output at high speeds, at any rate in Great Britain, where trains are relatively light. In the United States, however, where trailing loads of 5,000 tons are common, the necessity for higher speeds with these trains is coming to be realised, and electric locomotives in heavy freight service will be required to maintain their maximum output up to high speeds. In such locomotive applications it is desirable to raise the motor voltage as the motor current decreases when the train accelerates. With d.c. traction the possibility of doing this economically seems to depend on the use of a motor-generator or booster control. The use of additional rotating machines in the locomotive is undesirable, except perhaps in the case of mountain-grade electrification, where there is considerable advantage in using separately-excited motors, making regenerative braking automatic. The only locomotives yet built which can maintain their horse-power output up to the highest speeds at which they can operate have been of the motor-generator type. The weight efficiency of these locomotives is rather low.

The limitations enumerated above do not apply with the same force to a.c. equipments. If a characteristic curve were drawn for an a.c. commutator motor, the constant-



Assembly of 940 h.p. single-phase 12-pole motor on an express locomotive of the Reichsbahn. 7,000 cu. ft. of free air a minute are passed through the motor

* From a paper entitled "Electrification of Railways," by Mr. A. M. Wright, M.Sc., which was awarded the Coopers Hill War Memorial Prize and Medal of the Institution of Electrical Engineers.



Double-armature **970** *h.p.* **(***hourly***)** *motor on the* **3,000-***volt express locomotives of the Italian State Railways*

voltage lines would have a much greater slope than in a d.c. motor, owing to the reactance. Consequently the disparity between the operation at constant voltage and the constant-output characteristic is not so great as in the case of d.c. motors. In addition, it is easy to put over-voltage taps in the step-down transformer, so as to raise the motor voltage at high speeds. This has a similar effect to the field-weakening of d.c. motors. The a.c. traction motor has the important inherent characteristic, therefore, of approximating to a constant horse-power machine, and, when compared with a d.c. motor of similar rating, is capable of greater schedule speeds when the distance between stops is fairly large, involving periods of high-speed running.

PARLIAMENTARY NOTES

Southern Railway Service

Lord Kilmaine, speaking in the House of Lords on February 5, called attention to the electric service on the Southern Railway, and especially to that between London and Hastings and between Brighton and Hastings. The Southern Railway had electrified their line between Hastings and London, Victoria. They in the south of Sussex had all been led to expect that when this was accomplished they would have the great benefit of a much-improved train service. These hopes had not been fulfilled. All the trains run from Hastings to London now went right out of their way to Eastbourne and then they went up to London. They were very slow trains, as they took an hour to get to Haywards Heath and a further hour and twenty minutes to get to Victoria. His chief grievance was against a two-coach service between Hastings and Brighton. It stopped at all stations and halts. It took from one hour and a quarter to one hour and twenty minutes to get to Brighton. There was no lavatory accommodation on the train. He had written frequently to the superintendent of the line and had had interviews with him, pointing out that Bexhill, St. Leonards and Hastings contained many old and infirm people. There had been lavatory accommodation on every train in the steam traction days. The answer he got was that if anybody did not feel well he could get out of the train at one of the stations.

He hoped that it might be made compulsory for every railway to provide, lavatory accommodation on every train making over an hour's journey.

Lord Rockley said that he might as a senior director of the Southern Railway make a few remarks. The question of lavatory accommodation on local trains seemed hardly one which deserved the dignity of a debate in Parliament. It might be more suitable to bring such matters before the annual meeting of the railway company or to discuss it with some official of the company. As regards speed and management of the trains, there were considerably more than twice as many trains under electrification as there had been under steam. In all local services it had not been the custom of any railway in Great Britain, so far as he knew, to supply lavatory accommodation where the trains had to run only for travellers of short distances and stopped frequently at stations. The general opinion of railway management for such trains was it was better to provide ample seating accommodation than lavatory accommodation. What he thought was most essential was the question of broad policy rather than minor matters. The railways had had a very difficult time recently. They were always being pressed for increased facilities and the more those requests were endeavoured to be acceded to the more difficult it became in view of competition to provide adequate facilities. The companies could not go in for those small improvements, if they should be improvements, when so many large issues were at stake.

Lord Monkswell expressed regret at the remarks of Lord Rockley, which he said, were full of the ordinary excuses from railway officials. It filled him with regret that administrators could not grasp the fact that the public were disgusted with the total lack of trouble that the officials under them took to carry out the interests of the public. He also complained that trains were unpunctual.

The Earl of Radnor said that a very large number of people were increasingly using the new electrified services, and that was the reason why the railway company were finding it necessary to extend their electrification. Such was the increase in the use of the electrified lines that the railway company could not possibly have carried the traffic which they now carried if those lines were still run by steam.

The Earl of Plymouth (Parliamentary Under-Secretary for the Colonies) said that the matters their Lordships were discussing concerned the detailed internal arrangements of the railway company, and the Government had no wish to interfere.

The subject was then dropped.

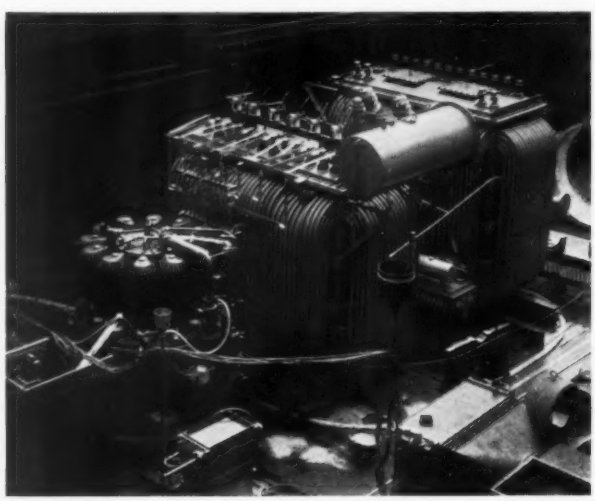
NOTES AND NEWS

Traction Switchgear.—A new type of manual closing device for circuit breakers has been devised by Switchgear & Cowans Limited, and is shown in one of the illustrations on this page. This spring-loaded closing device is mounted

Circuit breakers fitted with new closing device

below the standard operating mechanism, and enables the circuit breaker to be closed by hand under short-circuit conditions.

Rectifiers for the Portsmouth Electrification.—The Southern Railway has ordered 27 rectifier substation equipments for the electrification of the Portsmouth main line from Bruce, Peebles & Co. Ltd., of Edinburgh, which firm supplied the mercury arc rectifiers for the Brighton and Hastings extensions. This order for 67,500 kW. (in 2,500-kW. units) of rectifier equipment is



The type of rectifier, of 2,500 kW. capacity, which is to be used for the Southern Railway Portsmouth electrification

the largest ever placed in Britain. The type of rectifier equipment is shown in one of the illustrations on this page; the rectifiers themselves operate in conjunction with 33-kV. three-phase 50-cycle oil-cooled transformers, and the 27 equipments will be installed in 26 substations and their operations controlled by attendants at Woking and Havant.

Manchester Tube.—A special committee has been appointed by Manchester Corporation to consider the desirability of a comprehensive investigation for an underground electric railway across the city. The most urgent proposals are said to be for a tube to connect the Exchange and Victoria stations with the London Road and Central stations, and a tube to connect the city with Wythenshawe.

Birmingham Electrification.—In a lecture to the Electrical Association for Women on February 26, Mr. E. W. Ashcroft said that railway electrification schemes in the Birmingham area were at present being considered by the L.M.S.R. and the G.W.R. Mr. Ashcroft believed that it was admitted by all railway authorities that the network of railways serving the area of Birmingham and Wolverhampton was exceptionally favourable for electrification on account of the existing high traffic density and the potential passenger traffic which could be won back from the roads, but as the greatest housing growth in Birmingham had taken place in the direction of Coventry, served by the L.M.S.R. line to London, the suburban electrification was linked up with that of the main line.

Publication Received

Mercury Arc Rectifier Practice. By Fredk. Charles Orchard. London: Chapman & Hall Limited, 1, Henrietta Street, W.C.2. $8\frac{1}{2}$ in. × 6 in. × $1\frac{1}{4}$ in. 224 pp. Illustrated. Price 15s.—Although the mercury arc rectifier has been an established feature of d.c. railway electrifications for five or six years, the literature on it is still scanty, and much of that extant is so specialised and so highly theoretical that it is of value to a very small proportion of those actively interested. Limiting himself to a little over 200 pages, the present author has made no attempt to cover the rectifier from the cradle to the grave. After a brief but enlightening and practical description of the general principles, he explains the construction of glass-bulb and steel-tank equipments, and then delves into the installation, testing, and maintenance of rectifier substations. He has done this with a balance, clarity, and brevity which is most creditable; there is scarcely a paragraph in the text which could have been left out, yet there is barely one point which needs amplification. Grid control has been given a chapter to itself, and notes on the comparative costs of substation plant and operation are presented in a concluding chapter. There is no section of the work which has received preferential or biased treatment, and both the line and half-tone illustrations are reproduced cleanly and to an adequate scale. Too much importance need not be attached to the author's claim that the book may be of benefit to students and juniors, for every author who sits down to write a technical or scientific book seems to regard this unfortunate class of person as flowers to be picked by the wayside. This work on rectifiers is eminently suitable to the man who has mastered the ABC of his craft by a combination of theory and practice, and by such, be they designers, constructors or operators, it will be a book to be kept handy.